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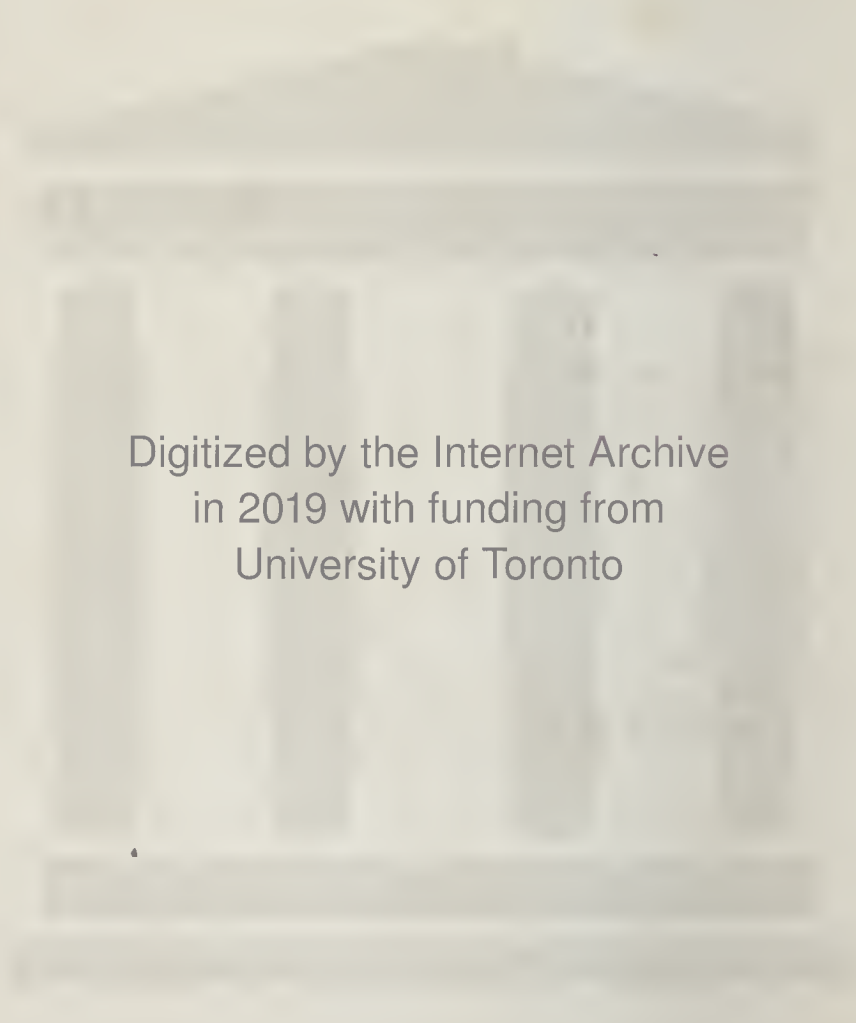
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Donald A. H. Simon

Shelling

First Prize

July 1861.



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CURIOSITIES AND WONDERS
OF THE
VEGETABLE KINGDOM.

There's no corner of the earth, no spire of grass, no leaf, no twig,
wherein we may not see the footsteps of a Deity.—BISHOP HALL.

Acquaint thyself with God, if thou wouldst taste His works.

COWPER.

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FLOWERS AND LEAF OF THE COCA TREE.

CURIOSITIES AND WONDERS

OF THE

VEGETABLE KINGDOM.

THE COCA TREE.

Erythroxylon Coca.

“Oh that men will put an enemy into their
mouths, to steal away their brains.”

SHAKSPEARE.

THE Coca is a tree, the leaves of which are used by the inhabitants of Peru as opium is by Eastern nations, and spirituous liquors by Europeans. The following account of its baleful effects is condensed from the travels of Dr. Pœppig.

The Erythroxylon Coca is a shrub, from six to eight feet high, having the general appearance of a

straight-growing blackthorn bush, or tree, which, from its numerous small white flowers and the pleasing green of its leaves, it greatly resembles. In its cultivation as an article of trade, great care is taken, and the plantations of the shrub, called a cocol, have a neat and regular appearance, though the frequent stripping of the leaves, which are reproduced but slowly, reduces it almost to a naked brushwood. The time of gathering the leaves depends upon the greater or less richness of the soil : on the best land it may take place in three years, but in poorer situations it cannot be ventured upon till after the lapse of five years. The full grown shrub affords a harvest every fourteen or fifteen months ; but as the ripeness of the leaves depends very much on situation and the age of the plants, in large plantations the gathering goes on throughout the whole year. The maturity of the leaves is ascertained by their stiffness. If they bend when taken hold of, they are too young ; but if, on the contrary, the leaves break, the gathering must not be delayed, or the plant will shed them of its own accord. The mode of gathering is to grasp the twig firmly, and strip off the foliage with some force ; a task which wounds even the

hard skin of the natives. These leaves are dried in the sun, but as rain in that climate is frequent, and the sky so enveloped with clouds and fogs that the sun is not seen for weeks, great quantities are spoiled; for when once the leaves become black, and shrink, in consequence of moisture, the flavour is lost and they are unsaleable. This loss might be easily avoided if the people were not too indolent to build proper drying places, where artificial heat might be employed, instead of continuing to use the wretched spots in front of their dwellings, which they keep for that purpose. If the drying can be accomplished in one day, the article is esteemed the best, is eagerly sought for, and fetches a high price. In this state the leaf is of a beautiful bright green, and quite smooth. The best prepared Coca is wrapped in woollen cloths and placed in the house, and, when ready to be sent out, is pressed into woollen sacks, made for that purpose by the Indians of Conchucos.

All old authors agree that the use of the Coca may be traced to the highest antiquity; that in the days of Manco Capac the leaf was so much prized as to form a part of every sacrifice to the gods; and wherever the Incas went, they dis-

tributed these leaves as a boon to the conquered nations.

In the present day the Indian is seen stretched out alone under the shade of some wide spreading tree, putting into his mouth by turns some Coca leaves and some finely powdered lime. Silently, and unwilling to be disturbed, he consumes a good half hour in this enjoyment, slowly swallowing the juice and renewing the masticated leaves by fresh ones. While thus engaged, not all the haste and impatience of the traveller in whose service he may be hired, nor even the approach of a heavy storm, can rouse the Indian from this state of intolerable apathy. The servant would instantly quit any white man who attempted to restrain him in this respect, and he would rather be deprived of necessary food, than employ in any other manner the period allotted for the enjoyment of his Coca. Even the farmers of the country are compelled to give way to this infatuation of their workmen.

The miner will for twelve long hours strive at the formidable and heavy work of the mine, and sometimes even lengthen that period, without taking any other sustenance than a handful of parched maize ; but every three hours he makes a

pause for the purpose of chewing Coca. He would work ill, and reluctantly, if the overseers deprived him of his favourite herb, and he exerts himself fourfold if he is allowed to take brandy with it, thus heightening, as he says, its pleasant taste. The same is the case with the Indian, who, as a porter, messenger, or vendor of his own productions, travels the Andes on foot. Merely chewing Coca from time to time, he travels with a load weighing a hundred-weight on his back, over indescribably rough roads, and frequently accomplishes ten leagues in eight hours. During the revolutionary war, the undisciplined patriot troops, consisting of Indians from the Sierra, by dint of ample supplies of Coca and brandy, travelled long distances in a short time, and thus rendered themselves very dangerous to the Spaniards. When Europeans would have halted and bivouacked, the ill clad, bare-footed Indians merely paused for a short time to chew their Coca; and even now, the traveller who would keep his guide and companion in good humour, whether proceeding by boat or by mules, must, four times a day, consent to these tantalizing pauses. It has never answered to debar a Coquero (as they are called) from the indulgence of this

vice, for it is universally declared that he would sooner forego the use of everything than this. A workman of the common class, particularly if he be a real Indian, daily consumes from an ounce to an ounce and a half of Coca; the more extravagant chewers double this allowance, and sometimes even raise it to five ounces. Strangers are amazed at beholding such an infatuated passion for a leaf, which, whether fresh or dry, is only distinguishable by a slight scent, which possesses no balsamic properties, and when taken in small quantities has merely a grassy or at most a bitterish taste. The surprise, however, ceases upon the observation of its effects upon others or by one's own personal experience. We are then convinced that the Coca, by its property of stimulating the nervous system, possesses a power much akin to that of opium.

Rude nations have ever sought for artificial excitement. Under the effect of Coca the habitual dejection of the Peruvian leaves him, and his excited imagination presents images to his mind which would never occur to him in his usual condition.

If the Coca is less violent in its first effects than

opium, it is perhaps the more dangerous from their longer continuance. A series of observations can alone convince the novice of this fact, and without reference to it the long train of ills which attack the Peruvian can never be traced to their real source. The sight of an inveterate Coquero gives the desired explanation. Useless for every active pursuit in life, and the slave of his passions even more than the drunkard, he exposes himself to the greatest dangers for the sake of satisfying this degrading propensity. As the stimulus of the Coca is most felt when the body is exhausted by toil and fatigue, or the mind with conversation, the poor victim of this sinful indulgence then hastens to some retreat in the gloomy native woods, and, throwing himself under a tree, remains stretched out there, heedless of night or of storms, unprotected by covering or by fire, unconscious of the flood of rain, or of the tremendous winds which sweep the forest.

After having yielded for two or three entire days to the occupation of chewing Coca, he returns home with trembling limbs and a pallid countenance, a spectacle of misery, the result of vicious indulgence.

Whosoever meets with the Coquero under such circumstances, and, by speaking, interrupts the effect of this intoxication, is sure to draw upon himself the hatred of the half-maddened creature.

The man who is once seized with the passion for this practice, if placed in circumstances which favour its indulgence, is a ruined being. Many instances were related in Peru, in which young people of the best families, by occasionally visiting the forests, have begun to use Coca for the sake of passing away the time ; and, acquiring a relish for it, have from that period been lost to civilization. As if possessed by some evil being, they will refuse to return to their homes, and, resisting the entreaties of their friends, who occasionally discover the haunts of these unhappy fugitives, will either retire to some more distant solitude, or, when they have been brought back to the town, take the first opportunity of escaping.

Indeed, the lives of such wretched beings are embittered by the presence of civilized society ; for the white Coquero is shunned as the most dissolute drunkard, and, soon sinking into a semi-barbarous state, he dies a premature death from his excessive use of this intoxicating leaf.

An example of this kind fell under the Doctor's notice in an individual who lived with him in the solitary Pampayaco, and unworthily bore the honoured name of Calderone. He was of the fairest colour, and of very good descent, but for twenty years had resided in the mountains, where he dwelt in a hut hardly fit for a human being. Although scarcely forty years of age, he was more decrepit than most persons of sixty, and utterly useless for any common purpose of life, as no one could depend on his word. Priding himself excessively on his white colour, yet utterly averse to any exertions, the mere idea of a city life, with its accompanying restraints, was hateful to him. As he was a decided Coquero, he could only be of service when it was possible to keep this intoxicating herb from him. But when once the passion had seized him, which was at least every month, he would break through all restraint, and, disappearing in the forest, was lost for many days, after which he would emerge prostrated and powerless. He was of some use to the Doctor, as a good and eager sportsman, and his confidence and goodwill were soon obtained by a liberal supply of fine gunpowder. His disposition was generally kind,

but any remonstrance against his vices threw him into an ungovernable rage.

He frequently assured the Doctor, in his confidential moments, that he would rather, as he had done for months together, live alone in the midst of some Coca shrubs, in the most solitary spot in the wilderness, depending for support on his fishing-line and gun, than return home to his family at Huanuco, and live at ease. His description of the lonely visions that appeared to him in the forest at night, and of his delightful sensations at such moments, had something in them awful to a Christian mind. When it rained, he used to cover his half-naked body with the sodden leaves that had fallen from the trees, and he declared that when this wretched substitute for clothing was brought to steam by the heat of his body, he could lie for hours thus enveloped, without suffering inconvenience from either wet or cold.

The exciting principle of the Coca seems to be of a very volatile nature ; the leaves in which this quality principally resides, after being kept twelve months, become perfectly inert, and good for nothing. Large heaps of the freshly-dried leaves,

particularly while the warm rays of the sun are on them, diffuse a very strong smell, like that of hay, in which there is a quantity of melilot. The natives never permit strangers to sleep near them, as they would suffer violent headaches in consequence. When kept in small portions, and after a few months, the Coca loses its scent, and becomes weak in proportion.

The Coquero carries a small bag, in order to preserve the leaves entire ; for he considers the broken ones to be worth but little, and the fragments and dust he throws away. Besides this bag, he has a small calabash containing very finely-powdered lime. Through the stopper of the calabash runs a metal needle, which is moistened when used, turned about in the powdered lime, and drawn into the mouth by the ball of chewed leaves, taking care not to touch the lips with the caustic lime, which would excoriate the palate even of the most practised Coquero. The teeth are infallibly destroyed by it ; and those of the Peruvians who are addicted to this custom, are black and carious.

The Doctor made trial of an infusion of this leaf, and found it had a flat, grass-like taste ; but he

experienced to the full its stimulating properties. When taken in the evening, it was followed by great restlessness, loss of sleep, and other uncomfortable sensations. Taken in the morning, a similar effect resulted, though in a slighter degree, accompanied with loss of appetite. An English physician, who had a sugar plantation near Huanuco, once, when unprovided with Chinese tea, made trial of the Coca as a substitute for it; but experienced such distressing sensations of nervous excitement, that he never ventured to use it again.

The consumption of Coca is confined to Peru, where the use of it, in greater or less quantities, is universal. Nay, such is the superstitious feeling attached to this practice, that the lowest classes at Huanuco thrust Coca into the mouth of the dying, and infer his future happiness from the pleasure which the taste seems to impart to him.

The inordinate use of it speedily occasions bodily disease, and injury to the mental powers. The appetite becomes irregular, sometimes failing altogether, at others assuming almost wolfish voracity, especially for animal food. Years of misery drag on, until a painful and lingering death terminates the sufferings of the sad, degraded *Coquero*.



FLOWERS AND FRUIT OF THE TANGHIEN TREE.

THE TANGHIEN TREE.

Cerbera Tanghin.

“In the corrupted currents of this world,
Offence’s gilded hand may shove by justice ;
And oft ’tis seen the wicked prize itself
Buys out the law ; but ’tis not so above—
There, is no shuffling, there the action lies
In its true nature, and we ourselves compelled
Even to the teeth and forehead of our faults
To give in evidence.” SHAKSPEARE.

THE fruit of this tree has been long used in the Island of Madagascar as a native ordeal. The tree resembles a plum-tree, but its fruit is one of the swiftest and most deadly of vegetable poisons. The late King Radama, who had become somewhat enlightened, from his intercourse with Europeans, discouraged this senseless custom during the latter years of his reign. His successor, the present Queen, has, however, permitted its revival, and,

by having recourse to it in a case in which she herself was interested, made this abominable practice far more universal than it had ever been in any other period of the Hueva Government.

The greatest crimes for the detection of which this poison has been employed are conspiracy against the reigning monarch, accusation of sorcery or witchcraft (the great dread of the inhabitants), and the charge of being a poisoner. It must be observed that this ordeal is used where other proofs of crime are wanting. The Hueva (the inhabitant of Emerina), on the slightest indisposition or suspicion of having taken poison, assembles his slaves, and administers the Tanghien to them indiscriminately, in order, as he thinks, to detect the malefactor.

The Tanghien has been sometimes used to point out the guilt or innocence of persons charged with murder, burglary, &c. It is also frequently employed in settling disputes about property; but in such cases it is administered to the dogs of parties concerned, and of course the owner of the dog killed by the test is convicted in the penalties of the law, and is compelled to pay a fine as an assertor of false rights.

It is used in the following way :—The accused person, having eaten as much boiled rice as possible, swallows, without chewing, three pieces of the skin of a fowl, each about the size of a dollar. He is then required to drink the test, a quantity of scraped or bruised Tanghien nut, mixed with the juice of Bananas. The Panozondoha (denouncer of the curse), then placing his hand on the head of the accused, pronounces the formula of imprecation, invoking all direful curses on him if guilty. Soon after this, large quantities of rice-water are given, till the stomach rejects its contents ; when, if the three pieces of skin are found, all is well, the party is pronounced “ madio,” or clean, legally and morally innocent of the charge ; but if they are not found, he is considered guilty of the crime in question. Sometimes the corrosive nature of the poison acts with such rapidity, that life is destroyed before the ordeal is completed. Should the test prove the guilt of the party, and yet the Tanghien itself have not produced immediate death, the accused is generally killed by the bystander ; a club, a spear, or the rice-pestle, is used as the murderous weapon, and the brains of the unhappy being are dashed out on the spot. Sometimes the

victim is strangled ; in other cases the miserable sufferer is hurried away and buried before life is quite extinct ; or it may happen that he is left to perish in excruciating agonies, deserted by every one, family, friends, and all.

In the early part of the year 1830, the present Queen of Madagascar, who was ill, imagined herself to be bewitched ; and thinking that the death of the sorcerer alone would remove her complaints, desired that her land should be cleansed from sorcerers. Accordingly an ordeal was commanded in every town and village.

On the 9th of March, in obedience to the sovereign's mandate, the ordeal began. The accused persons, amounting to about thirty, including some of the highest in birth and rank in the kingdom, underwent the test. All the nobility recovered, while the common people, who, according to the usual jugglery, had been compelled to drink with them, died. The former, after their acquittal, made their accustomed entry into the town, borne in open palanquins, amid the shouting, dancing, and grimacing of thousands of the people.

An aged widow attended the administration of the ordeal to five of her children in one day, all

grown up, and having families. The first was proved innocent; the mother rejoiced almost to ecstasy. But ere the day had closed, she had to mourn the loss of three out of the five, and the orphan children were committed to her feeble succour.

In the following month of April, the Queen not having recovered, about an equal number of Malagassy ladies submitted to this disgusting ordeal; including the late king's wives, his sisters, and others of the royal family, the wives of the chief officers, and daughters of judges; with a few men, amongst whom was one judge. They all survived, and in due course made a grand entry into the town. Various inferior officers and common people drank with them, of whom one officer and several of the people died.

Among the ladies was a princess from the Saccatawa country, whom Radama married. She had been treated during his reign with more respect than any other female; but, having on one occasion attempted to run away and regain her native country, she had subsequently been closely watched, though not subjected to actual imprisonment. Her establishment consisted of a few Saccatawa servants, and displayed no kind of pomp

Thus, defenceless and unprotected, it was absurd to think the princess could injure any one ; and there was a peculiar severity in her case, as she had no friend to watch over the fairness of the administrator's conduct, or to rejoice in her recovery. She wept bitterly when passing to the place of trial, and the natives sympathised with her by what they term "mifady ahitra," or an adjuration of the grass. This is performed by plucking up a piece of grass from the ground, and holding it up, as if to say, "May such misfortunes be far from us, as we would avoid treading on the very grass of the village where such sorrow dwells." On the day of the ascent to the town, after the acquittal, this princess acted with a dignity quite peculiar to herself. Whilst all the others remained some time in the country to dance, gesticulate, and receive congratulations, she proceeded home, without pausing anywhere, her attendants making a mere humming sound expressive of joy. The queen showed some good feeling by sending her especial congratulation, saying that, "though Radama was gone, she would be a mother to her, and never injure her."

In May, after the females had undergone their

ordeal, the administrators themselves were compelled to drink along with the others, making in all about sixty persons. Two of the former and two of the common people were victims, and the survivors made the usual triumphal entry.

After this the Skias, or diviners, took their turns, several of whom died. The particulars of the death of one are, that "his stomach became prodigiously swollen, his legs enlarged, his features distorted — and he expired in great agony." Those who lay accusation and administer the poison are great pecuniary gainers, as a dollar and fifty-three cents is given by every one who recovers, besides perquisites and private presents. When the accused dies, the officiating squad receives one twenty-fourth of the whole property not bequeathed before the accusation. The diviners also reap a large harvest from these iniquitous practices. They attend daily for eight or ten days before and after the drinking takes place, and receive one dollar, or many, according to the wealth of the accused.

When the accusation is made, no circumstance prevents any delay, no excuse is available. One of the officers accused in 1831, was actually

watching the corpse of his father when the appointed person knocked at his door. He begged to be excused till after the funeral, declaring that he asked only a few days' delay, and not exemption: no delay could be granted, and he was dragged from performing the last offices of filial affection to the scene of ignominious and protracted trial. In another instance, a man was ill of fever and unable to walk, yet no delay was permitted. He drank, and some credit was due to the Tanghien in consequence, for the violent sickness cured him completely of his fever. In such harsh cases, the nearest relatives and dearest friends dare not interfere, from the dread of being personally accused of holding league with the guilty, and thus being themselves compelled to drink. The deception practised in the whole transaction is evident to every sensible native.

It is well known that the selection of the fruit of the Tanghien requires great care, and that a mistake in this respect may destroy the innocent, or save the guilty. Thus the administrators have it in their power to permit any criminal to escape, and for a small reward they often exercise this partiality. They frequently recover slaves who

have been pronounced dead, by giving them copious draughts of water, in which certain herbs have been boiled. The individuals so saved are sent to a great distance and sold, as they cannot be suffered to remain in the place where the ordeal has been administered to them; and they are disposed of as "prize property," their own fear preventing them from ever disclosing the transaction to the families of their new masters. Thus, among all the rich nobility who drank of the Tanghien in 1830, not one died. It is equally certain that the administrators can sacrifice whom they please.

The fruit which appears very red, is protested against by the friends of the accused, on the tacit understanding that such a fruit will destroy, whether innocent or guilty. On this account, during the ordeal of 1830, a few of the common people were always seized upon and compelled to partake with the nobility, and they usually consisted of those who had no friends or relatives to stand by them. It seems to be necessary that in every public administration of Tanghien some should perish, otherwise the plant would be considered to possess no judicial virtues.

One of the chief officers, during the trials of

1830, had the misfortune to vomit while eating the three spoonfuls of rice ; he was appointed to drink again in a few days, along with the slave who had carried the water for him, and who it was pretended had perhaps bewitched him. The officer recovered, but the poor slave died. As to the cause of the different operation of the fruit—sometimes acting as a poison, although generally as an emetic—no certain and satisfactory reason can be given. It is known that a difference, visible even to the naked eye, does exist between that fruit which only occasions sickness, and that which destroys life. The latter always presents a slight appearance of redness. The people declare that this hue is miraculously assumed, and regard the change as an infallible sign of death to the accused. Yet if this redness be exceedingly obvious, the relations who are present desire that such a fruit may be rejected and another chosen. This proposal is probably agreed to, but the next fruit exhibits the same ominous colour, and the victim dies. Several opinions are held by the natives on this subject. Some say that there are two kinds of trees, one poisonous, the other only emetic, and so similar in appearance, that none

but the administrators know the difference, and that they even sometimes err, in destroying when they intend to save, or saving when they intend to kill.

Another opinion is, that the fruit undergoes a change by age, when a slight putrefaction or decay takes place, and it becomes poisonous in the centre. It then falls from the tree, and is distinguished by being withered and wrinkled.

The question as to what constitutes sorcery is enveloped in great mystery. The existence of such supernatural agency is firmly believed by all the Malagassy, not excepting those who have learned and felt most of the power of the word of God. Many of these will admit that the whole proceeding of the Tanghien ordeal is but a money-getting artifice, yet none will allow that no such thing as sorcery really exists. They aver that incontrovertible proofs can be adduced of persons being bewitched becoming, without any other assignable cause, either fools or madmen, and acting as if entirely destitute of reason. There is no limit assigned to the supposed power of sorcery ; every evil which the Malagassy feel or fear, which they understand or do not understand, is ascribed to its influence.

But although no very distinct information can be gained of what constitutes a proof of sorcery, yet several signs are exhibited after the accusation, to those conversant with the business. The guilty person on being apprehended makes a boisterous assertion of his innocence, assuring his friends with the utmost confidence of his approaching escape. Various prognostics that are observed on the way to the place of drinking are unfavourable to him. On killing the fowl, of which the soup is made for the vehicle of the Tanghien, if the heart is observed to incline to the side, instead of being upright, it shows that the accused is "malaka," that is, crooked or guilty. The Tanghien turns reddish instead of pure white, the vomiting is attended with great pain and difficulty, and the skin is dry; whereas the innocent vomits easily, and perspires freely. Uneasiness and distress mark the whole appearance of the supposed guilty person; the eyes of the sufferer become red and fiery; he is unwilling to eat the rice or drink the rice water; swelling of the body and other signs of death appear; or if these symptoms do not come on, the poor wretch is presently killed, on the ground of the obvious signs of his guilt.

It is needless to make comments on the revolting character of everything connected with this subject. At present, so deeply rooted in the minds of the Malagassy, from the sovereign to the slave, is the belief of sorcery or witchcraft, and so blindly are they led in this belief, that the whole nation may be considered as labouring under a spell, which can only be removed (and would the time were at hand!) by the introduction of Christianity amongst this darkened generation. This, and all other evil practices and doings, will then fast fade away.

A somewhat similar kind of ordeal, practised in the East Indies, is mentioned by Warren Hastings, in a communication to the Asiatic Society. In this case, the person accused takes a certain portion of a poisonous root mixed with clarified butter. It must be eaten from the hand of a Brahmin. According to the Indian law, the person put upon his trial was to say, "Thou, O poison! art the child of Brahma, steadfast in justice and in truth; clear me from this heavy charge, and if I have spoken truly, become nectar unto me." Saying this, he should swallow the poison; and if he digest it, without any inflammation, the prince

shall pronounce him guiltless. In this, as in the ordeal by the Tanghien, the guilt or innocence of the accused entirely depends upon him who administers the poison, as none but himself can know whether the substance swallowed be deleterious or otherwise. The rich man, who could afford to bribe, might be tolerably certain to escape; while the poor man, who could not afford to do so, would fall a victim to his accuser.



THE MAHOGANY TREE.

THE MAHOGANY TREE.

(Swietenia Mahogani.)

“ ————— To know
 That which before us lies in daily life,
 Is the prime Wisdom.”

MILTON.

THE uses of Mahogany are too well known to render it necessary to mention them further than to say, that almost all our valuable furniture is made of it, and that it is peculiarly adapted to such purposes, in consequence of its great beauty, hardness, and durability, by means of which it may be carved into splendid ornaments, and will take the most exquisite polish. It is said, too, to be almost indestructible by worms, or in water, and to be bullet-proof, burying the shot without splintering it; hence the Spaniards used to make their vessels of Mahogany; and Captain Franklin

took with him to the shores of the Arctic Sea, boats constructed in England of that wood, as being the lightest (in consequence of the thinness of the planks) and the most portable, combined with great strength. Although the Spaniards were in all probability the first to bring this wood into use, and although the French must be allowed to produce the most highly finished and ornamental work from it, it is into England that by far the largest importations of it are made, and here it is most extensively employed. Jamaica formerly yielded the greatest quantity of this wood, and the old Jamaica Mahogany is still reckoned more valuable than that afforded by other countries. The quality depends much upon the situation where the tree grows. In an elevated spot, where one would imagine there was scarcely soil to give nourishment to the roots, the wood is found to be of a superior grain and texture, whereas, in low alluvial situations, however vigorous and luxurious the plant may be, the quality of the timber is always inferior, more light, porous, and of a pale colour.

A very large proportion of the Mahogany now imported into Great Britain is derived from the

Honduras, where it is unquestionably produced in the greatest abundance, and where it is an important article of trade.

The first discovery of the beauty of Mahogany wood is attributed to the carpenter on board Sir Walter Raleigh's ship, as the vessel lay in some harbour in the island of Trinidad, in 1595. Dr. Gibbons brought it into notice in England. He was an eminent physician, about the end of the 17th or beginning of the 18th century; a box for holding candles, and then a bureau, made of a block of Mahogany, having been given to him by his brother, a West Indian captain.

At Honduras, a period of two hundred years is considered to be necessary from the time of the plant springing from seed to that of its perfection and fitness for cutting, an operation which commences about the month of August. The gangs of labourers employed in this work consist of from twenty to fifty each. They are composed of slaves and free persons, without any comparative distinction of rank; and it frequently happens that the conductor of such work, here styled the Captain, is a slave. Each gang has also one person belonging to it, called the Huntsman, who is gene-

rally selected from the most intelligent of his class, and his chief occupation is to search the woods, or, as it is called in this country, the bush, to find employment for the whole. Accordingly, about the beginning of August, the Huntsman is despatched on his important errand, and, if the owner be employed upon his own ground, this is seldom a work of much difficulty or labour. He cuts his way into the most elevated situation, among the thickest woods, where he climbs the tallest tree he can find, and thence carefully surveys the surrounding country.

At this season, the leaves of the Mahogany tree are invariably of a yellow-reddish hue; and an eye accustomed to this kind of exercise can, at great distances, discern the places where the wood is most abundant. To such a spot are his steps directed; and, without compass, or any other guide than that his recollection affords, he never fails to reach the exact spot at which he aims. On some occasions, no ordinary stratagem is necessary to be resorted to by the Huntsman, to prevent others from availing themselves of the advantage of his discoveries; for if his steps be traced by those who may be engaged in the same pursuit, which is a

very common occurrence, all his ingenuity must be exerted to beguile them from the true scent.

In this, however, he is not always successful, being followed by those who are entirely aware of the arts he may use, and whose eyes are so quick that the lightest turn of a leaf, or the faintest impression of a foot, is unerringly perceived: even the dried leaves that may be strewed upon the ground often help to conduct to the secret spot; and it consequently happens that persons so engaged must frequently undergo the disappointment of finding an advantage they had promised to themselves seized on by others. The hidden treasure being detected, the next operation is the felling a sufficient number of trees to employ the gang during the season. The Mahogany tree is commonly cut about ten or twelve feet from the ground, a stage being erected for the axe-men employed in levelling it. This, to an observer, would appear a labour of much danger; but it is very rarely that an accident happens to the people engaged in it. The trunk of the tree, from the dimensions of the wood it furnishes, is deemed the most valuable; but, for purposes of an ornamental kind, the limbs or branches are generally preferred, the grain of

them being much closer, and the veins more rich and variegated. When a sufficient number of trees are felled to occupy the gang during the season, they commence cutting the roads by which they are to be conveyed to the river. This may fairly be estimated at two-thirds of the labour and expense. Each Mahogany work forms in itself a small village on the banks of a river, the choice of situation being always regulated by the proximity of such river to the Mahogany intended as the object of future research.

In the arranging and appearance of the habitations much rural taste is often displayed. We have frequently seen houses of this kind completed in a single day, with no other implement than the axe; consequently, every workman is capable of performing the labour required to build his own dwelling. After completing this establishment, a main road is opened for it, in as near a direction as possible to the centre of the body of trees so felled, into which branch roads are often made. The ground through which the roads are to run is a mass of dense forest of high trees and underwood. They commence clearing the underwood with the manchet, a kind of cutlass, which, although

in appearance but a slender instrument, yet, from the dexterity with which it is used, answers the purpose admirably.

This labour is usually performed by task-work of one hundred yards each man, per day, which expert workmen will perform in six hours. The underwood being removed, the larger trees are then felled by the axe, as even with the ground as possible, the task being also at this work one hundred yards per day ; although it is more difficult, from the number of hard woods growing here, which, on the failure of the axe, are removed by the application of fire. The trunks of these trees, although many of them are valuable for different purposes, such as the Bullet-tree, Iron-wood, &c., are thrown away as useless, unless they happen to be near to some creek or small river which may intersect the road ; in that case, they are applied to the construction of bridges, which are frequently of great size, and require vast labour to make them of sufficient strength to bear such immense loads as are brought over them. The quantity and distance of the road to be cut each season depends upon the situation of the body of the Mahogany trees, which, if much dispersed or scattered, will increase the

labour and expense of road-cutting; and it not unfrequently happens that many bridges, and miles of road, are made to a single tree, and which tree may ultimately yield but one log.

The roads, being cleared of all the brushwood, still require the labour of hoes, pickaxes, and sledge hammers, to level the hillocks and break the rocks, and such of the remaining stumps as might impede the wheels that are hereafter to pass over them. When the roads are ready, which will generally be in the month of December, the "cross-cutting," as it is technically called, commences. This is merely dividing crosswise, by means of the saw, each Mahogany tree into logs, according to the length; and it often occurs, that while some are but long enough for one log, others, on the contrary, will admit of four or five being cut from the same tree,—the chief guide for dividing the trees into logs being to equalize the loads which the cattle have to draw, and prevent their being over-burdened; consequently, as the tree increases in thickness, so the logs are reduced in length. This, however, does not altogether obviate the irregularity of the loads, and a supply of oxen are constantly kept in readiness to add to the usual numbers, according

to the weight of the log : this becomes unavoidable, from the very great difference in the size of the Mahogany trees ; the logs taken from one tree being about three hundred feet, while those from another may be as many thousand. The largest log ever cut in Honduras was of the following dimensions :—length, 17 feet ; breadth, 57 inches ; depth, 64 inches ; measuring 5,168 superficial feet : weight, 15 tons. The sawing being completed, the logs are separated one from the other, and placed in whatever position will admit the largest square to be formed, according to the shape which the end of each log presents, and are then reduced by means of the axê into a square form, although some of the smaller logs are brought in round. With the larger description, it is essential to make them square, not only because the weight is thereby lessened, but because it prevents their rolling on the truck or carriage.

We now reach the month of March, when all the preparation before described is, or ought to be, completed ; and the dry season, or time for drawing down the logs from the place of their growth, begins.

This process can only be carried on in the

months of April or May, the ground during all the rest of the year being too soft to admit of a heavily laden truck to pass over without sinking; and although the rains usually terminate about February, yet, from the ground being so soaked with rain, the roads are seldom firm enough for use till the first of April. The Mahogany-cutter's harvest may be said to commence at this time, as the result of his season's work depends upon a continuance of the dry weather, for a single shower of rain would materially injure his roads. It is, therefore, necessary that not a moment should be lost in drawing out the wood to the river. The number of trucks worked is in proportion to the strength of the gang, and the distance commonly from six to ten miles. We will, for example, take a gang of forty men, capable of working six trucks, each of which requires seven pairs of oxen, and two drivers; sixteen to cut food for the cattle, and twelve to load or put the logs on the carriage. The latter usually take up a temporary residence somewhere near the main body of the wood, it being too far to go and return each day to the river-side, or chief establishment. From the intense heat of the sun, the cattle are unable to work during its influence; conse-

quently, they are obliged to use the night-time, instead of the day. The loaders, as before mentioned, being at their station in the forest, the trucks set off about six o'clock in the evening, and arrive at their different places of loading about eleven or twelve at night.

When the loaders, who are then asleep, are warned of the approach of the trucks by the cracking of whips carried by the cattle drivers, which is heard at a considerable distance, they arise and commence placing the logs upon the truck, which is done by means of a temporary platform laid from the edge of the truck, to a sufficient distance from the ground, so as to make an inclined plane, upon which the log is gradually pushed up from each end alternately. Having completed their work of loading all the trucks, which may be done in three hours, they again retire to rest till about nine o'clock the next morning. The drivers now set out on their return; but this progress is greatly retarded by their lading, and although well provided with torch-light, they are frequently impeded by small stumps that remain on the road, and which could be easily avoided in the day-time. In general, however, they are all out at the river-side by eleven

o'clock next morning, where, after throwing the logs into the river, having previously marked them on each end with the owner's initials, the cattle are fed, they breakfast, and retire to rest until about sunset; when they feed the cattle a second time, and yoke again.

Thus goes on the routine of trucking during the season, the loaders being employed in the interim for the return of the trucks. The process of trucking, or drawing down the Mahogany to the river, presents a most extraordinary spectacle. The six trucks often occupy an extent of road of a quarter of a mile in length; the great number of oxen, the half-naked drivers (clothes being inconvenient from the heat of the weather and the clouds of dust), each bearing a lighted torch, the wildness of the forest scenery, the rattling of chains, the sound of the whip echoing through the woods—and all this at the hour of midnight—make a singular and striking picture.

About the end of May the periodical rain again commences; the roads are impracticable in the course of a few hours; all the trucking ceases, the cattle are turned into pasture, and the trucks' gear, tools, &c., are housed.

The rain now pours down incessantly till about the middle of June, when the rivers swell to an immense height. The logs then float down a distance of two hundred miles, being followed by the gang in pitpans (a kind of canoe), to disengage them from the branches of the overhanging trees, until they are stopped by a boom placed in some convenient situation at the mouth of the river. Each gang then separates its own cutting, by the marks on the ends of the logs, and forms them into large rafts, in which state they are drawn down to the wharves of the proprietors, where they are taken out of the water, and undergo a second process with the axe to make the surface smooth. The ends, which are frequently split and rent by being dashed against rocks in the river, are also sawed off, and they are then ready for shipping.

The average expense of Mahogany cutting is usually estimated at about 70*l.* sterling per annum, each labourer, independently of the capital sunk in the purchase of the works, cattle, trucks, tools, &c.

Khaya senegalensis is the tree yielding African Mahogany, which is brought to us from Sierra Leone. The timber, though hard, is liable to warp, but it is employed where a hard and cheap wood

of large size is required, as for mangles, &c. The negroes employ an infusion of the bark of this tree, which is very bitter, as a febrifuge.

Chloroxylon tabularis is a native of the mountainous parts of the Circars in the East Indies, and much larger than the American tree. It yields the beautiful East Indian satin-wood, which is of a deep yellow colour, close-grained, heavy, and durable, much resembling that of the Box-tree. The natives call it *Billoo*.

Chikrassia tabularis is another Indian tree, greatly admired for its beautiful wood, which is very pale-coloured, close and elegantly grained, much employed for furniture and cabinet work. The most important species, however, and that which now nearly alone constitutes the genus, is *Swietenia Mahogani*. The Mahogany tree is one of the most elegant if not the largest tree in the countries in which it is found, frequently growing in the crevices of rocks and other places of the same description. The appearance of so large a vegetable production in such situations is to be accounted for from the construction of the seed, which is "winged," or capable of being borne along by the action of the air, and thus

deposited in holes and crevices in the rocks, where it speedily vegetates and springs up. As it increases in size, the roots gradually force asunder the walls of their rocky prisons, and throw off large portions of stone, thus by degrees penetrating into the very heart of the rock. It is not always found in these situations, the largest timber being produced in some of the flat and marshy spots on the coasts of America; of this description is that known by the name of Honduras Mahogany, which is much looser in texture and of less value than that from the mountainous districts of Cuba and Hayti. This last kind is known in commerce as Spanish Mahogany, and is chiefly purchased for the purpose of being cut into veneers. A few years ago, the Messrs. Broadwood gave the large sum of 3,000*l.* for three logs of Mahogany, which were each about 15 feet long and 38 inches square. The wood was extremely beautiful, and capable of taking the highest polish. The genus *Swietenia* was so named from the celebrated Baron Van Swieten, author of some botanical tracts, and physician to Maria-Theresa, Empress of Germany. It was at the suggestion of Van Swieten, that the Botanic Garden at Vienna was first instituted.

THE UPAS TREE.

Antiaris Toxicaria.

" Fierce in dread silence, on the blasted heath,
 Fell Upas sits, the hydra tree of death :
 Lo ! from one root, the envenomed soil below,
 A thousand vegetative serpents grow ;
 In shining rays the scaly monster spreads
 O'er ten square leagues his far diverging heads,
 Or in one trunk entwists his tangled form,
 Looks o'er the clouds, and hisses in the storm.
 Steeped in fell poison, as his sharp teeth part,
 A thousand tongues in quick vibration dart ;
 Snatch the proud eagle towering o'er the heath,
 Or pounce the lion as he stalks beneath ;
 Or strew, as marshalled hosts contend the plain,
 With human skeletons the whitened plain."

OF all the vegetable productions with which we
 are acquainted, there is not one, perhaps, which
 has excited more curiosity or more dread than the
 celebrated Upas, from which the inhabitants of
 Java, and of the Molucca Archipelago, derive



LEAF AND FRUIT OF THE UPAS TREE.

their noted poison. The Upas tree, as it was called, was described as being of an enormous

size, rising from the ground in countless trunks, and spreading over a space of many square miles, while each trunk was covered with disgusting scales, and the whole appearance was said to resemble a huge collection of venomous serpents. No vegetation grew within its baneful influence—one withered and arid space surrounded it on all sides. The birds of the air drooped and died if they chanced to wing their course within reach of its noisome exhalations; while the beasts of the forest which came near instantly sank under the influence of the poison. The whitened bones of animals and men were the only objects which broke the painful monotony of the scene.

To procure the exudation from the tree, criminals condemned to death were employed; for even avarice itself seemed to be palsied by the dread horror of the tree, and the largest bribes would induce no one to venture upon what was deemed a certain and painful death. The criminals themselves were driven to their task, and a species of compassion was shown even to them, as they were furnished with masks, and every protection which could be devised to screen them from the fatal exhalations; but in nearly every case care

was vain,—the poison was inhaled, and frightful convulsions and death ensued. Such were the accounts given by the inhabitants of the island to the various travellers who made inquiries ; and the very detailed character of the stories, and the pains taken to obtain information, always resulting in the same account, gave to these statements, however exaggerated and marvellous, an appearance of truth.

There is no doubt but that the very anxious curiosity of the Europeans induced the natives to impose upon their credulity by embellishing their narration. The naturalists of Europe, however, unwilling to give credence to the numerous and extraordinary fables which were promulgated on the subject, endeavoured, by every means in their power, not only to ascertain correctly the nature of this poison, but to learn with certainty the tree from which it was procured. The strict secrecy preserved by the inhabitants of the island of Java and elsewhere, for a long time rendered all research fruitless. The idle tales, indeed, which had been received were refuted, but no real information was elicited. At length the endeavours of Sir Stamford Raffles were crowned with success ; and an account

of the tree was given by Dr. Horsfield, in his Memoirs of that indefatigable naturalist and most amiable and excellent man. In the year 1834, however, Mr. Spanhogue, who had resided many years in Java, during which time he devoted himself to the study of the natural history of that island, was appointed Dutch President de compagnie on the island of Timor, where he discovered the real Upas tree. Several specimens of the poison were brought to him from Sunda and other neighbouring islands. The accounts of both these gentlemen will be blended in the following description, as will also the Memoir of Monsieur Leschenault, published in the 10th volume of the "Annales du Muséum d'Histoire Naturelle." This gentleman was the first to whom we are indebted for an authentic account of its history and real properties.

The Ipo (Upas tree), or *Antiaris toxicaria*, grows to a considerable height, sometimes reaching a hundred feet. The trunk of a tree of this size measures about eighteen feet in circumference near the base. It is tolerably straight, with a smoothish white bark and white wood. The leaves are oval; they fall off before the blossoms appear, and do

not shoot again till the fruit is ripe. This is something like a plum, of an oval form, velvety, and of a purple colour. It is somewhat singular to remark that the natural order to which this tree belongs, includes not only the *Antiaris toxicaria*, the most virulent of all known poisons, but also embraces in its ranks the Fig, the Bread-fruit tree, the Mulberry, and the famous Cow-tree, or the Palo de Vaca of South America : a curious instance of the harmless, the wholesome, and the most deleterious united in one order.

The Upas, or Ipo (a word which, in the native language, signifies vegetable poison), has been invariably found in fertile spots, surrounded by a profusion of vegetables, which seemed to be entirely uninjured by its proximity. Neither is its neighbourhood hurtful to animals, as Monsieur Leschenault saw lizards and insects upon its trunk, and birds perch upon its branches. The vapour of the juice, which flows from an incision of the bark of this tree, is in some instances dangerous in its effects ; this property is common to many of the Shumachs and Euphorbias, and the American Manchineel, and especially so to some persons whose skin or constitution is particularly apt to

absorb these emanations, while others are not affected by them.

This was well exemplified by Monsieur Leschenault, who desired a Javanese to bring him down some flowering branches from the tree. To enable him to climb, the man was obliged to make notches in the trunk: he had hardly got up as high as twenty-five feet from the ground, when he became ill, and was compelled to descend. He continued sick for several days, suffering from vertigo, nausea, and vomiting; while another Javanese, who was desired to do the same thing, climbed to the very top, brought down what was wanted, and suffered no inconvenience. Monsieur Leschenault himself caused one of the trees, which was four feet in circumference, to be felled; he walked among its broken branches, and had his face and hands sprinkled with the gum which dropped upon him, without being in any way affected by it. It is true that he took the precaution of washing himself immediately. Dr. Horsfield also mentions that, in clearing grounds near the tree, the inhabitants do not like to approach it, as they dread the cutaneous eruption which it is known to produce when newly cut down. But at all times, excepting when the

trunk is extensively wounded, or when it is felled—by which a large portion of the juice is disengaged, the effluvium of which, mixing with the atmosphere, affects the persons exposed to it with the symptoms just mentioned—the tree may be approached and ascended like the other trees of the forest. He states, however, that the common people of the island make from the inner bark a species of very coarse cloth, which they wear when working in the fields; but persons clad in this dress, on being exposed to the rain, are affected with an intolerable itching, which renders their flimsy covering almost insupportable. The governor, also, had caps or bonnets prepared from the same bark, stiffened in the usual manner with rice-water, and handsomely painted, for the purpose of decorating his attendants; but they all refused to wear them, stating that if they did so, the caps would cause the hair to fall off. The manner in which the poison is prepared is as follows:—Either to check the curiosity of strangers, or to magnify the interest which always attaches to those who have undertaken a perilous enterprise, the men who prepare it affect great mystery. They alone pretend to understand the secret of preparing

the poison. They live in the interior of the mountains, and are called Orangdaias. They make an incision in the bark of the tree, from which a gummy substance exudes; this is generally collected in the evening, and is preserved in a joint of bamboo. About eight ounces of this is carefully strained into a bowl. Half a drachm of arum, amomum, common onion, garlic, and black pepper is then added, and the mixture is stirred. A single seed of *capsicum fruticosum* is then placed in the fluid in the middle of the bowl; the seed begins to reel round rapidly, now forming a circle, then darting towards the side of the cup; a perceptible commotion of the liquor is very evident, which lasts for about a minute. When at rest, the same quantity of pepper is again added, and another seed of the capsicum laid on as before; a similar commotion takes place, but in a less degree, and the seeds are whirled round with less rapidity. The addition of the same quantity of pepper is made a third time, and a seed of the capsicum placed as before in the centre of the fluid; it now remains quiet, forming a regular circle, resembling the halo of the moon. This is the sign that the preparation of the poison is complete.

There is no doubt that those vegetables which have been selected by the inhabitants of the places where they grow for the purpose of poisoning their arrows are eminently virulent; but these poisons, which often minister to the cowardice or cruelty of those who employ them, are not obvious, but are concealed in different forms in their respective plants, and various processes must be used to extract them. Man, who ever avails himself of all the means that can add to his power, seems to have detected this fatal secret of nature almost everywhere, and to have increased its effects in many different ways, both by the substances which he has added to augment the activity of the poisons, and by the manner in which he has employed them.

The use of poisoned arrows may be traced back to very remote antiquity, and almost all barbarous nations in every quarter of the globe employ them, and always endeavour to conceal the deadly secret. The savages of Surinam imbue their darts with the poisonous juice of a large tree, but the very genus of the tree is at present unknown.

The Ahouaignuecu, the Piana or Curara, and the

Wourali,* which grow on the banks of the Amazon river, respectively serve the natives of America for the same purpose.

* "In the wilds of the Macoushi country," says Waterton, "a vine grows which is called *wourali*: it is from this that the poison takes its name, and it is the principal ingredient. When the Indian has procured enough of this, he digs up a root of a very bitter taste, ties them together, and then looks about for two kinds of bulbous plants, which contain a green and glutinous juice. He fills a little quack, which he carries on his back, with the stalks of these; and lastly ranges up and down till he finds two species of ants. One of them is very large and black, and so venomous that its sting produces a fever; it is most commonly to be met with on the ground. The other is a little red ant, which stings like a nettle, and generally has its nest under the leaf of a shrub. A quantity of strong Indian pepper, the pounded fangs of the Labarri and Counachouci snakes are added. He then scrapes the vine and bitter root into shavings, and puts them into a colander made of leaves; this he holds over an earthen pot, and pours water on the shavings; the liquor which comes through has the appearance of coffee. When a sufficient quantity has been procured, the shavings are thrown aside. He then bruises the bulbous stalks, and squeezes a proportionate quantity of their juice through his hands into the pot. Lastly, the snakes' fangs, ants, and pepper are bruised and thrown into it. It is then placed on a slow fire, and remains until reduced to a thick syrup of a deep brown colour. A few arrows are then poisoned with it to try the strength. It is then poured into a calabash, or a little pot of Indian manufacture,

There are several other plants in the eastern hemisphere which bear a strong resemblance to the Upas, and which are also employed by the natives of the parts where they grow to poison their arrows.

Those used by the Javanese in hunting have their tips shaped like the head of a lance, and imbued with the Ipo; those intended for war are furnished with a little shark's tooth, or a small copper blade, which is lightly inserted into the dart, and fastened there by the gummy resin of the Ipo. The warmth of the blood dissolving this sub-

which is carefully covered with a couple of leaves, and over them a piece of deer's skin tied round with a cord. They keep it in the most dry part of the hut, and from time to time suspend it over the fire, to counteract the effects of dampness. In preparing this poison, many precautions are considered necessary. The women and young children are not allowed to be present, lest the Yabahou, or evil spirit, should do them harm. The shed under which it is boiled is pronounced polluted, and abandoned ever after. He who makes the poison must eat nothing that morning, and fast as long as the operation continues. The pot in which it is boiled must be a new one, and must never have held anything in it before. Add to this, the operator must take particular care not to expose himself to the vapour which arises from it while on the fire, for fear of his health."

stance, the point remains sticking in the wound after the arrow has been extracted, and the poison mingling with the blood causes speedy death. The smaller the opening of the wound is, the more dangerous it is; because, when the laceration is considerable, the bleeding that follows frequently carries away the poison which it gradually dissolves, and either weakens or totally destroys the effect.

When the poison is introduced into the blood in a liquid state, it is much less virulent than when it has dried upon the instrument which inflicts the wound. Probably the fluid state causes it to mix readily, and to be carried away by the blood which flows out; whereas, in the other case, it is gradually absorbed while it dissolves. In some experiments made with this poison, it was found that a chicken expired in from one to three minutes, according to the quantity of poison infused into the wound.

The flesh of the creatures thus killed is not at all affected; it is only necessary to remove those portions with which the poison has come into immediate contact. A dog lived for eight minutes, an arrow having been driven for half an inch into the thigh, and suffered to remain there. The Upas

appears to affect different quadrupeds with nearly equal force, proportioned to their size and disposition ; and a man, who was accidentally wounded in the elbow by an arrow poisoned with it, died in half an hour, with symptoms similar to those observed in animals. No antidote has yet been discovered to this poison. The Javanese state that sea-salt has proved efficacious against the virus ; but, from experiments made by Mr. Spanhoge and Mr. Delille, this remedy is almost entirely, if not quite useless, and only increases the sufferings of the victim. The common train of symptoms is a trembling of the extremities, restlessness, erection of the hair, affection of the bowels, drooping and faintness, spasms, hasty breathing, an increased flow of saliva, great agony, vomiting, difficult breathing, violent and repeated convulsions, and death.



THE COCO-NUT TREE.

THE COCO-NUT TREE.

Cocos Nucifera.

"Lo ! higher still, the stately palm trees rise,
 Chequering the clouds with their unbending stems,
 And o'er the clouds amid the dark blue skies,
 Lifting their rich unfading diadems.
 How calm and placidly they rest
 Upon the heaven's indulgent breast,
 As if their branches never breeze had known !
 Light bathes them aye in glancing showers,
 And Silence, 'mid their lofty bowers,
 Sits on her moveless throne."

WILSON'S Isle of Palms.

THE Coco-nut tree, in regard both to the variety and utility of its produce, is the most interesting of "those princes of the vegetable kingdom," the palm tribe.

It grows from sixty to ninety feet high, and the stem is crowned with a cluster of about twelve or fifteen palm leaves, each twelve to fourteen feet long, and composed of a double row of opposite

sword-shaped leaflets, in length from three to four feet. A single leaf closely resembles a magnified ostrich feather. The fruit or nut is very hard, and has three unequal holes at the base, covered with a black membrane ; the interior part is white and solid, commonly containing a sweetish watery liquid. Ripe nuts are known by shaking them. There is a palm called the King's Coco-nut, the fruit of which is of a bright yellow colour ; nuts of this kind contain a great quantity of fluid, which, on account of its supposed cooling quality, is given to invalids, in preference to that of the common nut, but they are not esteemed so good for culinary purposes. The tree sometimes bears fruit in five or six years from the time it is transplanted from the seed-bed, but the produce is rarely abundant until the eighth or ninth year. It continues to yield fruit from fifty to seventy years. In good soils, and particularly during wet seasons, the tree blossoms every four or five weeks ; hence there are generally fresh flowers and ripe nuts on the tree at the same time. There are commonly from five to fifteen nuts in a bunch ; and in good soil a tree may produce from eight to twelve bunches, or from eighty to a hundred nuts annually. Trees which

grow near the sea are much more luxuriant and productive than those which are planted inland, or upon elevated situations. They are frequently struck by lightning, which often kills the bud, and occasions the death of the tree.

In Ceylon the Coco-nut tree is most extensively cultivated, and the following remarks are intended more immediately to apply to the tree as it grows in that island.

It does not appear that the Coco-nut tree is nearly as much cultivated in the West India islands as in the East. In some estates of Jamaica groves of them are planted, and an oil extracted from them to light the works during crop time; and occasionally the nuts are served out to the negroes as an article of food.

The root of the Coco-nut tree is sometimes masticated by the Cingalese in place of the Areca.*

* The Areca tree is the smallest of the palms, and grows perfectly straight. The stem is not more than thirteen inches in circumference, and attains to the height of sixty feet. The leaves shoot out from the top, and are much smaller than those of the Coco, which in shape they considerably resemble. The nuts grow in clusters at the bottom of the leaves, are of an oval shape, a little larger than a nutmeg. The skin is smooth, of a bright gold or orange colour, occasionally speckled with brown. The inside

The Brazilians make baskets of the small roots. The hard woody shell of the trunk is employed by



THE ARECA.

of the kernel is solid, of a white colour, streaked with red. These, nuts are in general use as a luxury for mastication throughout India and the Eastern Archipelago. It is considered an antiscorbutic for the teeth and gums, and to give the breath an aromatic odour; but its habitual use gives an appearance of bleeding at the mouth, which in the women is very disgusting. The properties of the Areca nut as a dye are well known in Scotland: it is of a peculiar red, and cannot be mistaken by any one accustomed to the colour. One of these trees produces from three hundred to a thousand nuts annually; they bear but once a year, but commonly there are green nuts enough to eat all the year long. The leaves fall off every year, together with the skin upon which they grow. They also clasp about the buds or blossoms which bear the nuts; and as the buds swell, so this skin-cover gives way to them, till at length

natives for drums, and in the construction of their huts, &c. It is also much employed in making gutters. Towards the base of the trunk the wood is remarkably hard, and admits of a high polish. "I have seen," says the Rev. J. Cordiner, "a polished portion of the wood set in the lid of a silver snuff-box, in the same manner as jewellers occasionally fix agate or cornelian. In some parts, I am informed that a cradle is made of the network-like substance, resembling coarse cloth, which

it falls off with the great leaf on it. It is somewhat like leather, and of great value to the country people. It serves them instead of basins to eat their rice in, and when they go a journey, to tie up their provisions; for in these they can tie up any liquid, as oil or water, doubling the leaf in the middle, and rolling in the two sides almost like a purse. They are commonly about two feet long, and one and a half in breadth. In this country there are no inns; therefore people, when they travel, carry, ready dressed, what provisions they can, wrapped up in these leaves. A slice of Areca nut and a pinch of chunam (a fine species of lime made with calcined shells) are rolled up in a Betel leaf, put into the mouth, and chewed. The Areca nut corrects the bitterness of the Betel leaf, and the chunam prevents it from hurting the stomach. The Betel plant resembles the black pepper, and grows, like ivy, entwined about trees or props. The leaf is shaped like a heart, about the size of a man's hand, dark green, thick, and aromatic. It is eaten all over India with the Areca nut and other additions.

clothes the base of each leaf, and which falls off before the leaf attains maturity. This is chiefly used as a filter for straining the sweet juice which is extracted from the flowering sheath of the tree ; it is also made into a durable sackcloth, called gunny, which is used in making bags for transporting grain." The unexpanded leaves, or terminal leaf-bud, is occasionally eaten by Europeans, as well as by natives. When boiled it is tender, and forms a good substitute for cabbage. The natives sometimes preserve it in vinegar, and eat it as a pickle : when this part is removed the tree dies.

Many of the natives thatch their houses with Coco-nut leaves. To do this the leaf is split, and the leaflets of each half are then plaited and interwoven, by which means they are adapted for a variety of uses. In this state they are employed to thatch cottages, to shelter young plants from the scorching rays of the sun, to construct fences, to form the ceilings of rooms, and to make baskets for carrying fruit, fish, &c. The young leaves of the Coco-nut tree have a fine yellow colour, and a beautiful texture, like fine kid or satin. In some parts of Ceylon, great taste is evinced in ornamenting triumphal arches, as also ball-rooms and similar

places of public resort, with the leaves of this tree, and some very remarkably beautiful species of moss. As the young leaves are transparent, they serve to make lanterns, in the construction of which many of the inhabitants are very dexterous. The leaflets are sometimes used to write upon, and the instrument employed to make the impression is an iron stylus (or pointed piece of iron). The leaves of the Palmyra are, however, in more frequent use for this purpose: during the operation of writing, the leaf is supported by the left hand, and the letters scratched upon the surface with the stylus. Instead of moving the hand with which they write towards the right, they move the leaf in a contrary direction by means of the thumb of the left hand. The natives do not require tables to write upon. They can write standing, as well as walking.

Baskets for catching fish, shrimps, &c., are made of the tough ribs of the leaflet; the same substance is employed for many of the purposes for which we use pins. A bundle of these ribs is in universal use as a broom to sweep cottages; and when a European asks for a toothpick, his servant brings him a portion of one of these fibres.

In a domestic state elephants are fed chiefly upon Coco-nut leaves, and the animal evinces much sagacity in separating the elastic woody fibre from the thinner margin of the leaf. During the insurrection of the Kandyar country, in 1818, hospitals were constructed, of which the walls, roof, and every part except the framework, were made of Coco-nut leaves: they are capable of resisting all kinds of weather for a year or more.

To prevent thieving, the owners of Topes * frequently fix a Coco-nut leaf along the stems of fruit trees. As the leaf rustles much when touched, a thief is cautious of ascending the trunk of a tree, lest he should alarm some of the inmates of the neighbouring huts.

In warm climates it is customary to travel during night, to avoid the influence of an ardent

* *Tope*, an Indian name for grove. In Bengal, mango plantations are called topes, as well as those of the Coco-nut tree; but where groves of palms are reserved for toddy drawers, they are called toddy topes. The leaves are supported at the base by eight fibres capable of sustaining great weight. This fibrous support seems providentially adapted for the security of the passing traveller, from the constant danger that would otherwise attend him, whilst traversing the coco-nut *topes*, from the sudden falling of decayed branches, which its firm adhesion to the trunk prevents.

sun. Torches thus become necessary, and Coco-nut leaves are chiefly employed for this purpose. By tying the leaflets close to the centre rib of the leaf, the burning is prevented from being too rapid. Torches of this kind also are in constant use to obstruct the inroads of wild beasts upon cultivated fields, more particularly of elephants. In the interior of Ceylon, every field under cultivation must be watched during the night, to prevent the depredation which would be made upon the crops. When burned, the Coco-nut tree, especially the leaves, afford a large proportion of potash. The caste of washermen avail themselves of this quality, and procure all the potash they require by burning to ashes the different parts of the tree. Soap is very little used by the native washermen of Ceylon. The centre rib of the leaf forms a substitute for paddles, and boats are rowed with them.

Many useful products are derived from the flower and fruit of this tree. Sweet juice is extracted from the unexpanded flower, by first cutting off the end of the bud, and then tying a cord just below, and beating it with a stick; the juice begins to flow from the cut surface of the flower, and is carefully collected in an earthenware vase suspended

from its sheath. A portion of the flower is sliced off daily, and the stump bound with a ligature. A good healthy blossom will give from two to four English pints of sweet juice daily, and some flowers will continue to yield juice for about four or five weeks. The Gomuti Palm yields toddy for two years, at the average rate of three quarts a day.

Toddy is the name given by the English to the sweet juices which are extracted from the different species of the palm tribe, including that of the Coco-nut tree. Fresh drawn juice is sweet, and has a peculiar flavour. When it is intended to distil arrack from *suri* (as it is called), the toddy drawers seldom change or clean the pots into which it is received; hence the juice soon ferments, and emits an acid smell. In a half-fermented state, *suri* is much relished by some Europeans. When it has become, by fermentation, highly intoxicating, the European soldiers, and the dissipated portion of the natives, drink it freely.

The *suri* pots are sometimes visited, and the contents carried off during the night. To detect the thief, the leaves of a species of *Datura* (thorn-apple) are occasionally put into the pots: by means of the highly intoxicating effects of this compound

the marauder is often discovered. *Suri* is the yeast commonly used by bakers in Ceylon. By allowing it to pass into acetous fermentation, an excellent vinegar is obtained. A great variety of vegetable substances are pickled with vinegar of this kind. Jaggery,* a kind of sugar, is also extracted from the *suri*. When closely mixed with lime, jaggery forms an excellent cement, which resists moisture and endures great heat. In Madras, and some other parts of India, the flat tops of the houses are covered with this cement. It is much employed to cover columns, as also to form the floors of rooms. Floors of this kind are sometimes stained, and made to resemble the finest marble. It is capable of taking a fine polish.

When the flower has not been injured, the tree bears nuts, which are converted to many useful purposes. Young Coco-nuts are much used by the natives as an article of diet. During the unripe

* The Jaggery, or Jaggree, is another kind of palm, so called from its fertility in the production of sugar. In general appearance it resembles the Coco-nut tree, with the addition of blossoms and clusters of fruit hanging down in perpendicular strings, three or four feet long, from the bottom of the leaves all round the top of the stem.

state of the fruit, the shell is lined with a pulpy substance, while the centre is filled with a watery fluid: this is at first slightly astringent and sub-acid; when ripened, the juice becomes sweetish, and not unlike the colour and consistence of the whey of milk. When drunk before the sun has far advanced, it is much cooler than the atmosphere, and is then a pleasant beverage. Natives, particularly when travelling, generally furnish themselves with a few unripe nuts, the water of which they drink, and eat the pulpy portion or kernel. Upon a few repasts of this kind, a man will labour from morning to night without any other article of diet. The husk, or fibrous covering of the nut, is employed to polish furniture, and to scour the floors of rooms, &c. Birds who build pendulous nests, commonly construct them of this substance. Its chief use, however, is in the manufacture of *coir*; the fibres are twisted into yarns, which are manufactured into cordage of all sizes. *Coir* is remarkably buoyant, and well suited for ropes of large diameter. Until chain cables were introduced, all the ships which navigated the Indian seas had cables made of this substance. The natives sew the planks together, which compose their

boats, with coir-yarn. It is also much used in India, in place of hair, to stuff mattresses, cushions for couches, saddles, &c.

The natives of the Ladrone islands eat the kernel of the ripe Coco-nut, in lieu of bread, with meat and fish. Sometimes it is rasped into very small pieces, and mixed with dressed rice, to give it a peculiar flavour; and occasionally it is pounded into meal, of which fritters and small cakes are made. By a little pressure, the kernel may be made to yield a white fluid resembling milk. When the milk of buffaloes cannot be procured, Europeans sometimes add this liquid to tea, as a substitute. When mature, the nut is much used in Ceylon to furnish an oleaginous fluid required to prepare curry. For this purpose the kernel is finely rasped, and the raspings are washed with a small quantity of water, which is subsequently filtered. The emulsion thus formed is boiled with the meat, fish, or vegetable substance intended to be curried. But the chief product of the Coco-nut is an excellent oil. In Ceylon, this oil is universally used by both Europeans and natives as a lamp-oil; for anointing the body, and by surgeons in medical preparations. Mixed with a species of resin, and the compound

melted, a substance is formed which is much used in India, instead of pitch, to pay the seams of boats and ships. The same compound is employed to protect the corks of wine and beer bottles from the depredations of the white ant.

In this country it has been employed as a lamp-oil, and, in the manufacture of cloth, instead of olive-oil. Soap and excellent candles are made from it. The shells of Coco-nuts are manufactured into beads for rosaries. They are also used as drinking vessels, and for various other domestic purposes. Occasionally they are polished by the natives, who cut figures in relief upon them. When thus ornamented, and bound with silver, they are used by the English as sugar basins. They are converted into charcoal; and, when mixed with lime, are employed to colour the walls of houses. Goldsmiths use them as fuel. Particular virtues have been attributed to cups made of this nut: they have been supposed to prevent apoplexy resulting from the immoderate use of the intoxicating liquor held in them. The Cingalese, when planting Coco-nut trees, invariably throw a little salt into the holes before they place the young plants in them; and they observe great regularity in form-

ing their *topes*, by making holes for the plants in parallel lines, from twenty to twenty-four feet apart. If the salt were omitted, they would not expect the plant to flourish.

A double Coco-nut tree, the heads of which branch off, about sixty feet from the ground, like the letter Y, and whose average produce is equal to two good trees, is considered by the superstitious natives as an omen of great good fortune to the family to whom it may belong. Knox, in his relation of a residence in Ceylon, published in 1681, thus describes another superstition connected with the Coco-nut :—

“ When a robbery is committed, to find the thief they charm a Coco-nut, which is done by certain words ; and any one can do it that can but utter the charm words. They then thrust a stick into it, and set it either at the door or hole where the thief went out. Then one holds the stick with the nut at the end of it, and the nut pursues and follows in the track that the thief went. All the way it is going, they still continue charming, and flinging the blossoms of the betel-nut tree upon it. And at last it will lead to the house or place where the thief is, and run upon his feet. This nut will

sometimes go winding hither and thither, and sometimes will stand still. Then they follow their charm, strewing on blossoms, and that sets it forward again. This is not enough to find the thief guilty; but if they intend to prosecute the man upon this discovery, the charmer must swear against him, point blank,—which he sometimes will do upon the confidence of the truth of his charm; and the supposed thief must either swear or be condemned. Oftentimes, men of courage and mettle will get clubs, and beat away the charmer and all his company, and by this means put all to an end.

“*I*, doubting the truth of this, once took the stick, and held it myself, when they were upon this business; but it would not go forward while I held it in my hand, though they strewed their flowers, and used their mutterings to provoke it. But afterwards, when another took it, it went forward. I doubted whether they did not guide it with their hand, but they assured me it guided their hand.”

The name *Coco* seems to be a contraction of the Portuguese word *macoco*, monkey, said to have been given from the resemblance between the end

of the shell, where the three black scars are, and the face of the monkey.

Coco-nuts are brought to Europe as wedges to set fast casks and other round packages in the cargo of vessels : their freight costs nothing.



THE BREAD-FRUIT TREE.

THE BREAD-FRUIT TREE.

Artocarpus integrifolia.

“ The bread-tree, which without the ploughshare yields
 The unreaped harvest of unfurrow’d fields,
 And bakes its unadulterated loaves
 Without a furnace in unpurchased groves,
 And flings off famine from its fertile breast,—
 A priceless market for the gathering guest.” BYRON.

THERE are two kinds of the Bread-fruit Tree in Ceylon: that called the Jack-tree grows after the manner of a Chestnut tree, shooting forth branches in all directions, and often exceeding the bulk and height of the largest oak. The leaves are much used for feeding sheep, and are eaten by them with great relish. The fruit is first borne on the branches, then on the trunk, and finally on the roots. It is of an oval shape, of the size of a man’s body, two feet in length and the same in circumference, and fifty pounds in weight. It is covered with a thick green coat, marked like the skin of



LEAF AND FRUIT OF BREAD-FRUIT TREE.

the pine-apple. Within, it contains a great number of seeds, each enclosed in a fleshy substance of the

size and form of a green fig. This substance is of a yellow colour, of a rich and delicious taste, and forms a great article of food in Ceylon. The seed is twice the size of an almond. It is farinaceous like the chestnut, and when roasted tastes like the potato. As the fruit ripens, the natives cover it with mats, worked into the form of bags, to preserve it from the attacks of birds. In its unripe state they eat the whole, after the external coat is taken off, cutting it down in slices. Many Europeans are prejudiced against this fruit, and do not eat it on account of a nauseous smell, like carrion, which it emits on first being opened : none of this remains when it is prepared for table.

The other species, (*Artocarpus incisa*,) having fruit without seeds, is the real Bread-fruit, so much valued in Otaheite ; but in Ceylon the culture is little attended to, not being such a favourite as the Jack-tree.

It is about the size of a common oak, has a great number of branches spreading almost horizontally, and is rendered extremely elegant by the picturesque appearance of the leaves. These are scattered all over it, but not crowded one on another ; they are placed at such distances that their form

is distinctly seen. They are a foot and a half in length, and eleven inches wide, deeply indented like those of the vine. The fruit grows from twigs, which rise perpendicularly from the horizontal branches. It is of an oval shape, from nine to eleven inches long, and nearly as much in circumference, covered with a pale green coat similar to that of the Jack. It contains no seeds, but has a fibrous spongy core about an inch in diameter, running lengthwise through it. The rest of the fruit is as solid as a turnip. When simply boiled without any seasoning, it is tasteless and insipid. In the usual method of cooking it for the English table, it is first boiled, then toasted; the outer coat being taken off, a thick slice is cut all round, which is mashed with a large proportion of butter. It tastes like potatoes, but not so good.



ARAUCARIA IMBRICATA.

ARAUCARIA IMBRICATA.

——— “ To Him, ye vocal gales,
 Breathe soft, whose spirit in your freshness breathes;
 Oh ! talk of *Him* in solitary glooms,
 Where o’er the rock the scarcely waving pine
 Fills the brown shade with a religious gloom.”

THOMSON.

IN speaking of the natural productions which furnish food for man, the *Araucaria Imbricata*, a species of pine which affords to the Indians of the Patagonian Andes the greater part of their sustenance, is too important to be passed over. The following account of a visit to the place of its growth, is derived from the interesting travels of Dr. Poeppig in South America.

“ An alpine atmosphere, a severer climate than in the lower tracts of country, and, above all, a stony soil, seem indispensable to the growth of these truly regal trees. In the immediate neighbourhood of Antuco not a single tree is to be seen,

and it requires a fatiguing excursion to gratify the Naturalist's desire to behold a wood of *Araucaria*.

"Between Antuco and the Fort of Trun Leuviu runs a narrow valley, which being short, and full of a thick underwood, suddenly ascends, and is connected with the defile through which the river Rucüé flows, a narrow arch arising in its middle. Accompanied by a jolly countryman, who had known better times (for the Antucanos used to possess large herds), and who could give me accurate information about the mountains, I travelled this road, which is now nearly forgotten, and has been untrodden for many years.

"The thick vegetation prevented us from penetrating into this valley on horseback, and we therefore resolved, being each of us furnished with a woollen coverlet and some provisions, to proceed on foot. Such are the hindrances which everywhere impede the progress of those strangers, who, impelled by scientific motives or from mere curiosity, quit the few roads which connect the rare inhabited spots in the Andes.

"All around the small villages, or the solitary hut in which the traveller may have taken up his abode, stretches a wilderness destitute of inha-

bitants, through which nothing but an accurate knowledge of the localities can enable him to find his way. The native, whose occupation seldom induces him to quit the immediate vicinity of his residence, and who feels no curiosity to visit the uninhabited forests and defiles of the mountains, is mostly unacquainted with them, and cannot even aid the traveller by his descriptions. Thus the difficulty and delay consequent on procuring a guide often compel him to go alone. But if he be expert, accustomed to hardships, and well enough acquainted with the country to venture on the expedition, the sense of independence, and of increased self-confidence arising from success, will soon make him forget all the disagreeable feelings that first assailed him on the solitary journey. That he might suffer a lingering death from starvation, in places where none could seek him, is a thought which must not dwell on his mind, and which indeed seldom comes across the traveller, when, after great danger, he has attained the top of a lofty and hitherto unvisited rock, or finds his exertions rewarded by the harvest of new and beautiful things, that surround him in a deep and dark defile shut out from the sight of all mankind.

At the lower end of the valley through which we had to pass a fire had been raging, and all the trees stood without bark, the greater part, indeed, with half-charred stems. The wood itself is much altered by such a circumstance; for while its colour and compactness are improved for the purposes of manufacture, it becomes useless for fuel, and receives the name of 'pellin.' Forest conflagrations often occur from unknown causes in the uninhabited districts of the Andes, and consume everything up to the elevation where the Chilian knee wood and the dwarf beech tree grow, near the limits of perpetual snow. After such fires the forest never again throws up lofty stems, but produces only a thick underwood, that envelopes and destroys the higher trees that may have escaped. It is curious to observe the new and peculiar vegetation that in all parts of America succeeds such an occurrence.

"In Pennsylvania, the few forests that have hitherto escaped the ravages of the axe and fire, resemble a park, being quite free from shrubs; but scarcely has the track been burnt when a rhododendron, before unseen, shoots up, particularly on the lofty mountains, which present a

lovely spectacle, being loaded with flowers, that indeed form an impenetrable thicket. In places where not a single tree has escaped the devouring element, arises a bushy oak, the scrub oak, impeding the progress of the hunter, and proving the greatest enemy to the farmer, as its roots run deep, and throw up new shoots so readily, that it is almost impossible to eradicate it. In the warmer tracts of this part of the world, the consequences are more apparent. The formidable stinging tree nettle, the ugly species of *Psychotria* and *Piper*, presently occupy the bounds of the woods in Cuba; and where cultivation is not promptly employed, an impenetrable mass of crooked thorned *Smilaxes*, *Ipomeas*, and other climbing plants, soon occupy the soil.

“Towards the evening we had ascended the moderately high ridges of the valley, and the dense crown of trees that was seen above these indicated our near approach to the desired aim, and added new vigour to our exertions. When we arrived at the first *Araucarias*, the sun had just set; still some time remained for their examination. What first struck our attention were the thick roots of these trees, which lie spread



BRANCH OF ARAUCARIA.

over the stony and nearly naked soil, like gigantic serpents, two or three feet in thickness ; they are

clothed with the same rough bark as the lofty pillar-like trunks, which are from fifty to a hundred feet in height. The crown of foliage occupies only about the upper quarter of the stem, and resembles a large depressed cone. The lower branches, eight or twelve in number, form a circle round the trunk ; they diminish till they are but four or six in a ring, and are of a most regular formation, all spreading out horizontally and turned up at the tips. They are covered with leaves like scales, sharp pointed, above an inch broad, and of such a hard texture that it requires a sharp knife to cut them from the parent branch. The general appearance of the Araucaria is most striking and peculiar, though it certainly bears a distant family likeness to the pines of our country. Its fruits, placed at the end of the boughs, are quite round, and about as big as a man's head, and consist of beautiful layers of scales, that cover the seeds, which are the most important part of this truly noble tree. The Araucaria is the palm of those Indians who inhabit the Chilian Andes from lat. 37° to 48° , yielding to those nations a vegetable sustenance, that is found in greater plenty the more they recede from the whites, and the

more difficult they find it to obtain corn by commerce. Such is the extent of the Araucaria



FRUIT OF ARAUCARIA.

forests, and the amazing quantity of nutritious seeds produced by each full-grown tree, that the Indians are ever secure from want; and even the discord that prevails frequently among the different hordes, does not prevent the quiet collection of this kind of harvest. A single fruit contains between two and three hundred kernels, and there are frequently twenty or thirty fruits on one tree. And, as even a hearty eater among the Indians cannot (except he be deprived of every other kind of sustenance) consume more

than two hundred nuts a day, it is easily seen that eighteen Araucarias will maintain a single

person for a whole year. The kernel, which is the shape of an almond, and double its size, is covered with a skin that is easily removed.

“The Indians eat them either fresh, boiled, or roasted, and the latter mode gives them a flavour something like a chestnut. It is not easy of digestion, and is apt to disagree with those unaccustomed to the diet. When the scarcely ripe seeds are dried in the sun, a sugary substance exudes. For winter use these nuts are dried after being boiled, and the women prepare a kind of pastry from them. The collecting these fruits would be attended with great labour, if it were necessary to climb the gigantic trunks; but as soon as the kernels are ripe, towards the end of March, the cones drop off of themselves, and scatter liberally a boon, which nothing but the little parrot and a species of cherry finch divide with the Indians. In the vast forests, of a day’s journey in extent, that are formed by these trees in the districts of Pehuenches and Huilliches, the fruits lie in such plenty upon the ground, that but a very small part of them can be consumed. The wood of the Araucaria is red where it has been affected by forest fires; but otherwise it is white, and

towards the centre of the stem bright yellow. It is very hard and solid, and, if the place of its growth were not so inaccessible, might prove valuable for many purposes. For ship-building it would be useful, but is much too heavy for masts. If a branch be scratched, or the scales of an unripe fruit be broken, a thick milky juice immediately exudes, that soon changes to a yellowish resin, of which the smell is agreeable, and which is considered by the Chilians as possessing such medical virtues, that it cures the most violent rheumatic headaches when applied to the spot where the pain is felt. Steep rocky ridges, where there is no water, are the favourite habitats of these trees. We were obliged to seek for water at a considerable distance from the bivouac we chose near the forest of the Araucarias. Our frugal supper did not require much cooking, and we soon after stretched ourselves on the hard rock to sleep, under the lullaby of a storm, to which the lofty summits above us imparted the most singular tones. All of us who had been accustomed to such primitive beds might have rested well enough, if a fog had not descended upon us about midnight, which was so dense as nearly to extinguish our fire.

Matters became still worse, when violent thunder and hail apprised us that not even a forest of Araucarias could shelter the traveller from the wrath of the Cordillera. We all trembled; my companions, however, chiefly from fear and superstition, though the temperature was sufficiently low to occasion a shudder in thinly clad travellers. The anxiously looked for morning brought a brighter sky and the means of kindling a cheerful and genial fire, the comfort of which we greatly enjoyed.

“A young man who had joined us the preceding day succeeded (by means of his lasso, which he threw over one of the lowest branches) in ascending a tree, from which he brought down many branches loaded with their truly colossal fruit, which have since arrived in Germany. The reason why many of the seeds of the Araucaria that have been sent to Europe did not vegetate, is because the collectors did not procure them from the Indian country, but bought them in the market at Valparaiso, where they are offered for sale boiled and dried. My excursion to Quall y Leveu obtained for me fresh seeds of the Araucaria, which reached Germany in 1829, being seven months

after they were ripe ; and being sown immediately, the period was just that of the Chilian spring. Of some hundreds about thirty came up ; but ignorance of the true climate, which led to the error of placing the young plants in a hot-house, killed the greater part during the first year. To my great satisfaction, however, about six individual plants have been preserved in the different places. The specimen in the Botanic Garden at Leipsic flourishes beautifully."

"In 1795, Captain Vancouver touched at the coast of Chili, and Mr. Menzies, who accompanied the expedition, procured cones, seeds from which he sowed on board the ship, and brought home living plants, which he presented to Sir Joseph Banks, who planted one of them in his own garden at Spring Grove, and sent the other to Kew. From this circumstance the tree was called at first in England Sir Joseph Banks' Pine. The tree at Kew was kept in the green-house till about 1806 or 1808, when it was planted out. After it was planted out, not being considered quite hardy, it was protected during winter with a temporary frame covered with mats ; and having become habituated to this mode of treatment, it has been

considered unsafe to leave it off. The species is, however, now found quite hardy at Dropmore and other places, and we have no doubt that, as soon as plants can be procured from seed at a reasonable rate, it will be as generally planted as the Cedar of Lebanon or the Deodar Cedar, and will be found to be quite as hardy as these trees.”*

Of the rate of growth of this tree in its native country very little is stated by travellers. It is probably slow, as appears to be the case with plants in the climate of London, though scarcely any of them have yet had full justice done to them. The specimen at Kew, which is the largest in Europe, was in 1836, when its portrait was taken, 12 feet high, after having been above forty years planted; but young plants at Dropmore make shoots occasionally of above a foot in length. It may be remarked of the *Araucaria* in Britain, that sometimes young plants remain a whole year without making any shoot whatever, and that at other times the same plants require two years to produce one shoot; that is, the shoot continues slowly increasing in length from the midsummer of one year to that of the year following.

* Loudon's "Trees and Shrubs of Britain."

The *Araucaria* takes its name from being a native of the country of the *Araucarians*, a people who are said by Molina to pride themselves on their name, its signification being “frank” or “free.” Don Joseph Pavon describes the wood of this tree as of a yellowish white, fibrous, and full of beautiful veins, capable of being worked and polished with facility; he adds that the Indians consider the fruit as very nourishing, and distil from it a kind of spirituous liquor.

THE RELIGIOUS FIG TREE.

Ficus religiosa.

THIS tree is held in great veneration both in Ceylon and on the continent of India. In the Cingalese language it is called "bogaha," or the tree of Buddha. It drops no fibrous roots from its spreading boughs, but far surpasses the banyan in elegance and gracefulness of form, grows to a very large size, has a smooth bark, and is perhaps the most completely beautiful of all the trees which adorn the wide garden of nature. The leaves are peculiarly handsome, being exactly in the form of a heart, and having a long pointed extremity. When full grown they measure upwards of six inches in breadth at the broadest part, and eight in length, including the tapering point, which measures two inches. The fruit grows without stalks, in the same manner as the *Ficus indica*,

adhering to the smaller branches, but is rather less in size, and does not attain when ripe so bright a red.

This Religious Fig Tree is accounted the most sacred of trees in India, and is held in such high estimation in the country of Candy, that the form of its leaves is only allowed to be painted on furniture manufactured exclusively for the use of the King.

Knox, who resided in Ceylon for twenty-one years, from 1651 to 1671, thus describes the care taken by the natives of this tree, and the respect in which it is held by them. "The people pave round under them, sweep often under them to keep them clean ; they light lamps, and set up their images under them ; and a stone table is placed under some of them to lay their sacrifices upon. They set them everywhere in towns and highways where any convenient places are ; they serve also for shade to travellers. They also plant them as memorials of persons deceased, in the place where their bodies were burnt. It is held meritorious to plant them, which they say he that does shall die within a short time after, and go to heaven. But the oldest men only, who are nearest

death in the course of nature, do plant them, and none else, the younger desiring to live a little longer."

The Religious Fig Tree is planted near houses in India for the sake of its grateful shade. The Hindoo deity Vishnoo is fabled to have been born under its branches; and they have a tradition that Buddha, when he was upon earth, used to sit under its shade.



THE TALIPOT TREE.

THE TALIPOT TREE ;

OR, UMBRELLA-BEARING PALM.

Corypha umbraculifera.

THERE are few objects in the vegetable kingdom more remarkable and beautiful, or more useful to man, than the Talipot Tree, which is a species of the Palm (*Corypha umbraculifera*) peculiar to the island of Ceylon and the Malabar coast. Robert Knox * says, "it is as big and as tall as a ship mast;" but Cordiner gives more definite dimensions, by stating that one which he measured was a hundred feet high, and five feet in circumference near the ground. The stem of this tree is perfectly straight; it gradually diminishes as it ascends, the circumference of the upper part being half that of the base. It is strong enough to resist

* Author of "An Historical Relation of the Island of Ceylon," where he resided some years in the middle of the 17th century.

the most violent tropical winds ; it has no branches, and the leaves only spring from its summit. These leaves, which when on the tree are almost circular, are of such prodigious dimensions, being from thirty to forty feet in circumference, that they can shelter from eight to a dozen men standing near to each other. The flower of the tree, which shoots above the leaves, is at first a cluster of bright yellow blossoms, exceedingly beautiful to the eye, but emitting an odour too strong and pungent to be agreeable. Before its development the flower is enclosed in a hard rind, which upon the expansion of the flower bursts with a sharp noise. The flower shoots pyramidically to a great height, frequently adding as much as thirty feet to the elevation of the tree. From the flower proceed the fruit or seeds, which are as large as our cherries, and very numerous, but not eatable ; they are only useful as seeds to reproduce the tree. It appears that the natives do not sow them, but leave that operation entirely to nature. The flower and the fruit only appear once on one tree. Their appearance betokens that the tree has attained to old age, which, according to the natives, it does in a hundred years ; Ribeyro, a Portuguese writer, says thirty years,

which is more likely to be correct. As soon as the fruit or seeds are ripe, the tree dries up, and decays so rapidly, that in two or three weeks it is seen prostrate and rotting on the ground. Knox asserts that if the tree be cut down before it runs to seed, the pith, largely contained in the stem, is nutritious and wholesome; and adds, that "the natives take this pith, and beat it in mortars to flour, and bake cakes of it, which taste much like that of wheat bread, and it serves them instead of corn before their harvest be ripe." We have not found these cakes mentioned by any other writer on Ceylon; but, as Knox was so veracious and correct, we may admit that the natives were accustomed to make them. A better known fact about the uses of the inner parts of the tree is, that sago is made from them. The stem or trunk of the Talipot, like most other palms, is extremely hard without, but soft and spongy within. The sago is made by beating the spongy part in a mortar.

Still, however, the great usefulness of the tree is in its leaves: when growing on the tree these leaves are, when expanded, of a beautiful dark green colour; but those chiefly used are cut before

they spread out, and have and retain for ages a pale brownish yellow colour, not unlike old parchment. Their preparation for use is very simple; they are rubbed with hard pieces of wood, which express any moisture that may remain, and increase their pliability, which is naturally very great. The structure of this wonderful leaf, and the disposition of its fibres, are exactly like those of a fan: and it can be closed or opened like a fan, and with almost as little exertion. It is, in fact, used as a fan by the natives, and is at the same time their only umbrella and parasol; in addition to which uses it forms their only tent when in the field; and cut into strips, it serves them to write upon, instead of paper. The leaf is so light, that a whole one can be carried in the hand; but as this, from the great size, would be inconvenient, the natives cut pieces from it, which they use to defend themselves from the scorching rays of the sun and from the rains. The narrow part is carried foremost, the better to enable those who use them to penetrate through the woods and thickets with which most of the country abounds. No handles are used, but the two sides of the leaf are grasped by a bearer. "This," says Knox, in his quaint manner,

“is a marvellous mercy which Almighty God hath bestowed upon this poor and naked people, in this *rainy country*.” He ought to have added, and in this *hot country* ; for the heats of Ceylon are frequently and for long periods tremendous, and the Talipot leaf is quite as valuable a protection against them as against the rain.

However much rain may fall the leaf does not become wet, but remains dry and light as ever. The British troops, in the campaign in the jungles against the Cingalese in 1817 and 1818, found to their cost how excellent a preservative it was against wet and damp. The enemy’s musket-men were furnished each with a Talipot leaf, by means of which they always kept their arms and powder dry, and could fire upon the invading forces ; whilst frequently the British muskets, which had no such protection, were rendered useless by the heavy rains and moisture of the woods and thickets, and our men were consequently unable to return the fire of the natives.

As tents, the Talipot leaves are set up on end. Two or three Talipot leaves thus make an excellent shelter ; and from being so light and portable, each leaf folding up to the size of a man’s arm,

they are admirably adapted for this important service. The chiefs have regularly formed square tents made of them. In these, the leaves are sewed together, and laid over a light framework: the whole is light, and can be packed in a small compass. When used instead of paper, they are cut in strips, soaked in boiling water for a short time, rubbed backward and forward over a smooth piece of wood to make them pliable, and then carefully dried. The Cingalese write or engrave their letters with a pointed piece of iron, and then rub them over a dark-coloured substance, which makes them more easy to read. The colouring matter is reduced to liquid by being mixed with coco-nut oil, and when dry is not easily effaced. On common occasions they write on the leaf of the coco-nut tree; but the Talipot is used in all government despatches, important documents, such as title-deeds to estates, and for their books. A Cingalese book is a bundle of these strips tied together. As even the lawyers and the learned in this country are very deficient in chronological knowledge, great confusion occurs as to dates; and it is very common to see a Cingalese judge endeavouring to ascertain the antiquity of a document

produced in court by smelling and cutting it. The oil employed in the writing imparts a strong odour, which preserves it from insects ; but this odour is changed by age. The Talipot, however, appears to have of itself a natural quality which deters the attack of insects, and preserves it from the decay of age, even without oil.

The Cingalese, who engrave the most solemn of their deeds, such as the foundation of, or the donations to, a temple, on plates of fine copper, which are generally edged with silver, always make these plates precisely the same shape as the Talipot strips used for writing. The Cingalese further employ the Talipot leaf in thatching their houses. They also manufacture hats from it ; these hats are made with brims as broad as an outstretched umbrella, and are chiefly worn by women nursing, to defend themselves and their infants from the heat.

The Talipot at present is not a very common tree, and is rarely seen growing by those who only visit the coasts, and do not penetrate into the interior. It seems to grow scattered among other trees in the forests. The smell of the flower is very foetid ; and to this, when several trees are in

flower at the same time, the natives attribute whatever sickness may happen to prevail in the district. A full-sized leaf of the Talipot, gilt and highly ornamented, is held above the heads of the sovereign and of the priests of Buddha, and is afterwards considered sacred.

THE VARNISH TREE.

Stagmaria verniciflua.

THIS tree is a native of Sumatra and the Eastern Isles, and grows to a considerable size. The leaves are smooth and shining, about eight inches long; the flowers white, having rather a narcotic smell. The berry is as large as a fresh walnut, of a spongy texture, and, when cut, exudes an acrid juice; it contains a single seed, abounding with a corrosive gum or resin.

The wood of this tree is of a fine dark colour towards the centre, and lighter-coloured near the edge. The bark exudes a resin, which is extremely acrid, and if applied to the skin causes blisters. The people consider it dangerous to handle any part of the tree, and even to sit or sleep under its shade. This resin on exposure to the air soon assumes a black colour, and becomes hard; it is



FLOWER AND LEAF OF THE VARNISH TREE.

collected and employed as a varnish, and sells for this purpose at a high price. According to Rum-

phius, it is this tree which yields the so much celebrated Japan lacquer or varnish. The varnish of Siam and Cochin China is probably the best, but that of Celebes and Java, which is the produce of this tree, is also employed for the same purposes, and cannot be much inferior, since it bears as high a price.

The process of obtaining and using it is thus given by Rumphius. "The exhalations of this tree are considered noxious, and the people of Macassar and other parts of Celebes, in particular, entertain such dread of it, that they dare not remain long, much less repose, under its shade; they say, that whoever receives the droppings from it will have his body swell and be afflicted with malignant sores.

"As, however, it furnishes the so celebrated varnish, other people boldly repair to this tree, particularly the Chinese and Tonquinese, who employ great precautions in collecting the resin; which is accomplished in the following manner. A number of Chinese proceed about evening to the place where the trees grow, which is always at a distance from the resort of man or animals: each selects a few, and inserts into the trunks two pieces

of Bamboo, sharpened at their points in such a manner as to penetrate the bark in a somewhat oblique direction. These remain all night, and are extracted before sunrise the next morning, the tree yielding no juice during the day. The resin is found in greater or less quantity, according to the richness or poorness of the soil, and is obtained only at certain seasons of the year, particularly about the time of flowering. The people who collect it unite the fruit of their labour, and afterwards make a complete division of the whole ; on which account this resin maintains a high price, a single pikrel (containing a hundred catties) selling in those provinces of China which do not possess this tree for two or three hundred dollars : in Tonkin and Camboja, however, it may be had for thirty, fifty, or sixty-dollars. It is a custom among the Chinese, when they approach this tree, first to rub the trunk lightly, before inserting the bamboo, wishing by this to show that they are not afraid ; for they say that timid persons will sooner feel its noxious effects than those who are bold and fearless. The resin is prepared for varnish in the following manner.

“To one pound of resin add an equal weight of

the oil of Tang-yhu, a Chinese tree, from whose fruit a red transparent oil is prepared resembling our linseed oil. Others put one pound of oil to three of resin, which are gently heated together, and make a very black varnish. If, however, to one pound of resin two of oil be added, a varnish of a brownish-yellow is produced with which wood is lightly done over, to bring out the grain and veins. If, while the varnish is heated, red lead, powdered galls, or other dry pigments be added, it gives the same colour to the work on which it is employed. This liquid varnish ought to be covered with water, to prevent it from becoming hard. The articles to which the varnish is applied must always be placed in a cool and moist place to dry, which they do slowly; but when once hardened the varnish never becomes soft again, except by the suffusion of hot water, which often dissolves it.

“The Chinese carry this prepared resin in large pots from Siam and Camboja to Japan, where it is disposed of to great advantage. The Japanese are the most skilful in preparing and ornamenting all kinds of wooden articles with this varnish, of which they annually use large quantities; and their black lacquered works are dispersed, on

account of their elegance, over all parts of the world.

“Another tree very useful to the Chinese artisans is the Kou Chou, which resembles a fig-tree. This tree on incision yields a milk or liquid gum, which they use in gilding with leaf-gold. They wet their pencils with it, and then draw their figures and ornaments with the gum upon wood, over which they apply the leaf-gold, which is so firmly cemented by the gum, that it never detaches. This gum is in its effects like the transferring varnish now used in Europe, but more tenacious.”

ESCULENT VEGETABLES OF VAN DIEMEN'S LAND.

“ O hand of bounty, largely spread,
By whom our every want is fed ;
Whate'er we touch, or taste, or see,
We owe them all, O Lord, to thee :
The corn, the oil, the purple wine,
Are all thy gifts, and only thine.”

HEBER.

HOWEVER wild and uncultivated and devoid of human inhabitants any part of this globe may be, it will be discovered, as soon as such a spot is visited by man, that provision has been made for his support. Nowhere is proof more abundantly given of this merciful provision for the wants of man, than has been made known to us by botanical researches into the indigenous esculent plants which are to be found in Van Diemen's Land. These are chiefly of the fern and orchis tribes. The Tara fern, which in appearance very strongly resembles the common brake of England, covers

very extensive portions of open land, and varies in height according to the richness of the soil in which it grows. In some places it reaches to the height of a few inches only, in other and more congenial spots it arrives at a size so gigantic as to hide a man on horseback. The root creeps a few inches under the ground, and, when luxuriant, is about the thickness of a man's thumb. When turned up by the plough, the pigs eagerly devour it, and in light sandy soils they grub it up themselves. The aborigines roast it in ashes, and peeling off the outside black skin with their teeth, eat it with their roasted kangaroo, in the same manner as Europeans eat bread. It possesses much nutritive matter, and yet those persons who have been obliged to use it in long excursions through the bush, though they have supported life, became very weak and reduced. This may have arisen either from the parties resorting to it too late, or from their being too exhausted to procure it in sufficient quantity, or from eating it raw.

Great quantities of arrow-root may be procured from this root. When grated and reduced to a pulp by mixing it with cold water, the arrow-root is detached and sinks to the bottom of the vessel.

By pouring off the floating pulp and water, and adding fresh water, stirring up the white powder, and again allowing it to settle, it may be easily prepared for use. It may then be cooked by boiling, or the powder may be spread on cloths and dried in the sun, or hung up in linen bags where there is a free circulation of air.

The base of the inner leaves of the grass tree also affords food to the aborigines. The heads of these singular plants are beaten off by striking them about the top of the trunk with a large stick. The outer leaves are then stripped off, the inner leaves cut away, leaving about an inch and a half of the white tender portion adjoining the stem (like our artichoke). This portion is eaten both raw and roasted; the flavour is like that of a nut, and is also slightly balsamic. Other species of the grass tree are used in different parts of the colony. Small bulbs of the orchis tribe of plants, which are very numerous in the open and thinly wooded parts of Van Diemen's Land, are also eaten by the natives, and by cockatoos, kangaroos, rats, &c. Little holes often mark spots where the burrowing animals have been searching for them. One species, which springs from the decaying roots of

the stringy bark, produces tubers, growing one out of another, of the size and nearly the form of kidney potatoes. These are roasted and eaten by the natives, resemble beet-root in flavour, and are called in the colony "native potatoes." A species of fungus is often found, which grows to the size of a child's head; it is known by the name of *native bread*, and in taste resembles boiled rice. As is the case with the heart of the tree fern and the native potato, cookery produces very little change in its character. It is found attached to a rotten tree. Another esculent fungus grows in clusters round the swollen portions of the branches of the myrtle in the western part of the island. It varies from the size of a marble to that of a walnut; when young, it is of a pale colour, and covered with a skin like that of a young potato; this skin is easily taken off, and the remaining portion is eaten raw.

The esculent fruits of Van Diemen's Land which have hitherto been discovered are neither numerous nor to be compared to the commonest English kinds; but, in proportion as civilization advances, suitable trees will be introduced, and will rival those of, at present, more favoured climes.

THE GAMBOGE TREE.

Stalagmites Cambogioides.

THIS substance, so important as a pigment to the painter, and as a drug to the surgeon, was first made known to Europe a little more than two centuries ago. It was brought from China by the Dutch admiral Van Neek, and given by him to Clusius, Professor of Botany at Leyden, with a short account of its efficacy in dropsical complaints. It soon became pretty generally used in painting, and is now also useful in medicine; for, although a vegetable poison, it is, under due regulation, safely administered.

It is singular that the source of a substance so well known, and of such general use, should be involved in great obscurity; but so it is. This obscurity may be in a great degree accounted for, when we learn that the article in question comes



FLOWER AND FRUIT OF THE GAMBOGE TREE.

from China, where nothing is made known to Europeans which can in any way be concealed.

There are several kinds of Gamboge known in commerce, differing in quality, and even in nature, as well as in their place of origin. The finest sorts are generally supposed to come from the kingdom of Siam, and are imported into England from China by way of Singapore. A kind of Gamboge is also obtained from the island of Borneo; it is conveyed by the Malay coasters to Singapore, and is then bought by the Chinese to be purified and made up for the European market. Three kinds are known to commerce: the first, and the most valuable, is known by the name of pipe Gamboge; the second is of a little less value, cake Gamboge; the third, almost worthless, is coarse Gamboge.

For some time Ceylon was supposed to be one of the places from which Gamboge was imported, it having been long known to botanists that many trees in that island produced a substance very like the Singapore Gamboge, though inferior in quality. This, however, is erroneous; no shipments of such an article are made from Ceylon, all that we use coming, as has been before stated, from China, by way of Singapore. There are indeed, in tropical countries, many trees which yield a yellow juice so nearly resembling Gamboge, not only in colour but

in medicinal properties also, that they have each obtained in their respective countries the name of Gamboge plant.

During the residence of Mrs. Colonel Walker in Ceylon, she paid great attention to the botany of that interesting island, and particularly to the plants which produced the substance in question, with a view of clearing up the doubts and difficulties which existed about it. That lady discovered that a kind of Gamboge was obtained from different trees of the same genus. The fruits of two of these were used by the natives, one as an ingredient in their curries, the other as an eatable fruit. "The substance is obtained from an incision made in the bark, from which it issues in a thickish liquid state, and is of a light yellow colour : it soon hardens when exposed to the air, and becomes of a much deeper hue, and is then as perfectly fit for use in water-colour drawings as any prepared and sold in the London colour-shops."

From a very intelligent native Mrs. Walker ascertained that Gamboge is used by the Cingalese both as a pigment and a medicine. In the former case, when wanted as a yellow dye, it undergoes no preparation ; with the addition of a little lime

juice, they make a deep orange colour: both these tints are much used in the décoration of their temples, and Boodh himself is always represented in yellow garments. As a medicine the Gamboge is ground into a fine powder, and, being then mixed with the juice expressed from the leaves of the tamarind tree, is taken with a little water. This is the common mode of administering it, but when mixed with other ingredients it is considered by native practitioners to be beneficial in many diseases.

The Gamboge is collected by cutting pieces of the bark completely from the tree, about the size of the palm of the hand, and early in the morning. The Gamboge oozes out from the pores of the bark in a semi-liquid state, but soon thickens, and is scraped off by the collectors the next morning, without injury to the tree, the wounds in the bark readily healing, and becoming fit to undergo the operation again.

This is all that is at present known of the Ceylon Gamboge, which has, however, been lately introduced by the native Madras practitioners, and is now an article of sale in the bazaars on the Coromandel Coast; and there seems little reason to

doubt that, if sufficient care be taken with the Gamboge of Ceylon, it will be a perfectly efficient substitute for that which is now procured through Siam, by the Chinese; and even the very plant from which the Gamboge is obtained may be the same, or at least a kindred one, as no European botanist hitherto has seen the Siam tree, or even specimens from it. The very imperfect account given by Koenig was founded on a description communicated to him by a priest who was no botanist; and it may be supposed that, as the Boodhist religion is believed to have passed from Siam to Ceylon, and along with it the practice of painting the temple and holy dresses with Gamboge, the tree which yields Gamboge may have passed from one country to another at the same time.

Gamboge appears to have been first known in Europe about the year 1600; the quantity at present imported into England is about seven or eight thousand pounds annually.



THE BANYAN TREE.

THE BANYAN TREE.

Ficus indica.

“ So counsell’d he, and both together went
 Into the thickest wood : there soon they chose
 The fig-tree ; not that kind for fruit renown’d,
 But such as at this day to Indians known,
 In Malabar or Deccan spreads her arms,
 Branching so broad and long, that in the ground
 The bended twigs take root, and daughters grow
 About the mother tree, a pillar’d shade,
 High overarch’d, and echoing walls between.
 There oft the Indian herdsman, shunning heat,
 Shelters in cool, and tends his pasturing herds,
 At loop-holes cut through thickest shade. Those leaves
 They gather’d, broad as Amazonian targe,
 And with what skill they had, together sew’d,
 To gird their waist.”

MILTON’S *Paradise Lost*, Book IX.

THE Banyan is a tree which attracts a particular notice on account of one distinguishing and remark-

able property. Its horizontal branches naturally extend to a great distance from the parent stem, and being unable to support their own ponderous weight, as they shoot forward, fibrous roots drop perpendicularly from them, and after touching the ground swell to the size of pillars, and bear up the loaded boughs with the utmost firmness. These stems are smooth columns, covered with bark of a silver colour, and put forth no shoots. When they first leave the tree they are of a brownish hue, as flexible as hemp, and wave in the air like ropes. After entering the earth they become stationary, and are to be found about the same tree, some measuring less than three inches, others upwards of eleven feet in circumference. A full grown leaf of this tree is five inches long, and three and a half broad. The fruit is the size of a small cherry, of a deep scarlet colour, and has a bright yellow circular spot round that part of it which touches the tree. The flower, like that of all other figs, is contained within the fruit. They afford food to monkeys and a variety of the feathered race, but are not sweet to the taste, and are never eaten by man.

In the garden of Mr. John Shamier, Armenian merchant, at Madras, there is a very remarkable

specimen. Round this tree is a circle of low brick-work, ninety feet in diameter; the parent trunk measures twenty-eight feet in circumference, and is of a light brown colour. The tree has no appearance of decay, but seems flourishing in the prime of life, in full vigour. Thirty-seven descended stems are firmly rooted in the ground, and a considerable number of small fibres appear like loose ropes waving in the wind. Of the former, some measure only two and a half, others eleven feet in circumference, and they have descended from the height of from thirty to fifty feet. Immediately on the fibres reaching the ground the gardener surrounds them with a hillock of earth, which at once gives them firmness and assists their growth. Lord and Lady William Bentinck, soon after their arrival at Madras in 1803, visited this tree, and were entertained by the Armenian proprietor at an elegant breakfast under its boughs.

The full height of the Banyan Tree is from sixty to eighty feet, and many of them cover at least two acres. The wood is used only for fuel; but the pillars are valuable, being extremely elastic and light, working with ease, and very tough. It resembles a good kind of ash.

THE TALLOW TREE.

Croton sebiferum.

THE Tallow Tree is a native of China, and resembles in appearance a pear tree. The trunk is short and thick, and the bark smooth. They are usually planted in plains, and in regular order, somewhat like the cherry orchards of England. The leaves are either of a dark purple or bright red ; the blossoms yellow : this at a little distance gives the plantation the effect of an extensive flower-garden. The fruit is enclosed in a husk like that of a chestnut. This husk opens of itself when the fruit is ripe, and displays three white grains, about the size of a nutmeg. These contain the vegetable tallow so useful in China. The machine by which the fruit is bruised is a wheel moved backward and forward in the trunk of a tree, which is shaped like a canoe, lined with iron, and fixed in the



FLOWER AND LEAF OF THE BANYAN TREE.

ground. The axis of the wheel is attached to a long pole, which is laden with a heavy weight and

suspended from a horizontal beam. The berries thus bruised and divided are exposed to the action of steam for a considerable time, until they become very soft, when they are quickly thrown upon layers of straw, covered up again with other layers of straw, and spread about as quickly as possible. Men do this with their feet ; and, as the berries are very hot, and of course warily trodden on, the operation is said to bear a striking resemblance to dancing. The appearance of a number of men, gravely performing sundry evolutions on their toes, has been described as irresistibly ludicrous, particularly as it is unaccompanied by music. By this process large cakes are formed of the mingled grain and straw. The cakes thus formed are afterwards pressed in the same manner as the bruised seeds of the oil plant.

Pressure is not the only method of obtaining the tallow, for it is sometimes procured by boiling the bruised seed in water, and collecting the oily matter that floats on the surface. The tallow is hard and white, and has all the properties of that obtained from animals. Du Halde says, that three pounds of vegetable oil are mixed with every ten pounds of tallow, and that a quantity of wax is used to

give it consistence. The best candles are also coated with wax. When properly prepared they burn almost without smoke, and quite free from a disagreeable smell. It does indeed often happen that the candles prepared with Vegetable Tallow burn with a great flame, throw out much smoke, and consume very quickly; but this must be attributed to a slovenly and dirty mode of preparation, and to the nature of the wick, which is made of the bamboo, dry and light, and not unlike the wick of a rushlight. Candles made by Europeans of this tallow have been found very nearly equal to those of wax.

THE BAMBOO TREE.

Arundo Bambos.

“ They built them here a bower of jointed cane :
 Strong for the needful use, and light and long
 Was the slight framework, rear’d with little pain.
 Lithe creepers then the wicker sides supply,
 And the tall jungle grass fit roofing gave.”

SOUTHEY’S *Curse of Kehama.*

THE great reed called the Bamboo shoots up a considerable number of canes, from the same bottom, which are nearly of the thickness of a man’s thigh, and grow to the height of fifty to eighty feet. The leaves are small, narrow, and pointed, springing from the knots. The trees wave in the wind, presenting a very elegant feathery appearance. The pith of the young shoots, which is of a white colour, makes an excellent pickle, of as soft a consistence as beet-root. Williamson thus describes its important use to the natives of India in the construction of their dwellings :—

“ The materials of which their houses are made are always easily to be procured, and the structure is so simple, that a spacious and by no means uncomfortable dwelling, suited to the climate, may be erected in one day. Our habitation, consisting of three small rooms and a hall, opened to the north, in little more than four hours was ready for our reception : fifty or sixty labourers completed it in that time, and on emergency could perform it in much less. Bamboo grass for thatching, and the ground rattan, are all the materials requisite : not a nail is used in the whole edifice. A row of strong Bamboos, from eight to ten feet high, are fixed firm in the ground, which describe the outline, and are the supporters of the building ; smaller Bamboos are then tied horizontally, by strips of the ground rattan, to these upright posts. The walls, composed of Bamboo mats, are fastened to the sides with similar ligatures. Bamboo rafters are quickly raised, and a roof formed, over which thatch is spread in regular layers, and bound to the roof by filaments of rattan. A floor of Bamboo grating is next laid in the inside, elevated two or three feet above the ground ; this grating is supported on Bamboos, and covered with mats and

carpets. Thus ends the process, which is not more simple than it is effectual. When the workmen take pains, a house of this sort is proof against any inclement weather. We experienced, during our stay at Meeaday, a severe storm of wind and rain, but no water penetrated—our thatch escaped ; and if the tempest should blow down the house, the inhabitants would run no risk of having their brains knocked out or their bones broken,—the fall of the whole fabric would not crush a lady's lap-dog. The Bamboo bears neither blossoms nor fruit, but is propagated by suckers. In windy, dry weather their friction while waving often causes them to take fire, occasioning the hills on which they grow to assume a beautiful appearance at night."

Although no production of China is of so much importance to us as tea, there are others of equal or perhaps superior value to the Chinese themselves, and the Bamboo may be classed among them. In the hands of the Chinese, the Bamboo may be almost denominated a universal material ; for they perform with it operations the most various and dissimilar that can be imagined. This reed in its entire state is formed into stools, chairs, tables, bedsteads, and many other articles of furniture. It

supplies scaffolding for building, masts and yards for shipping, carts and wheelbarrows for husbandry, wheels and tubes for irrigation. Split into laths, or beat into fibres, it forms screens for ornaments, and ropes, cords, and twine for all purposes, from the rigging of a ship to the wick of a candle. Woven, it becomes a sail-cloth or a sacking. Macerated into a pulp, it is made into paper; and mixed up with lime, it serves to caulk their ships. By simply tying together four of these reeds, swimming-jackets are constructed capable of supporting one or more persons; and a machine is thus made for the prevention of drowning, equally efficacious with more elaborate life-preservers. When young it affords a nutritive article of diet; when growing it is a fence for their gardens and fields, a protection for their cottages, and an ornament for their palaces. It is the weapon of justice and the instrument of oppression; supporting equally the authority of the mandarin and the arrogance of the petty official. It almost seems that, without its use, the machinery of government would stand still, and the Chinese would want many of those accessories to comfort, which separate the civilised man from the savage.

The leaves are generally put round the tea sent to Europe. The thick juice is a favourite medicine. It is said to be indestructible by fire, to resist acids, and by fusion with alkali to form a transparent and durable glass. There are about fifty varieties ; and it is of the most rapid growth, rising from fifty to eighty feet the first year, and in the second perfecting its timber in hardness and durability.

There are two kinds of Bamboo in the Horticultural Society's garden, London, which have endured the open air for many years without any protection whatever.

One of these, *Bambusa Nigra*, was in 1837, seven feet high, with several stems varying in thickness from one quarter to one inch. Though a native of India, it appears nearly as hardy as the European reed. In Jersey there are several species and varieties in Saunder's nursery garden, which stand out perfectly well, without any protection.

THE VEGETABLE IVORY TREE.

Phytelephas macrocarpa.

THE Ivory nut is the produce of a palm tree found on the banks of the river Magdalena, in that part of South America formerly called New Granada, but now constituting the republic of Columbia. The natives of Columbia call it Tagua, or Cabeza de Negro (Negro's Head), in allusion, we presume, to the figure of the nut. The Indians cover their cottages with the leaves of this most beautiful palm. The fruit at first contains a clear insipid fluid, with which travellers allay their thirst ; afterwards this liquor becomes milky and sweet, and changes its taste by degrees, as it acquires solidity, till at last it is almost as hard as ivory. The liquor contained in the young fruits becomes acid, if they are cut from the tree and kept some time. From these kernels the Indians fashion the knobs of walking-sticks, the reels of spindles, and

little toys, which are whiter than ivory, and as hard if they are not put under water; and if they are, they become white and hard again when dried. Bears devour the young fruit with avidity. The part of the kernel which is thus similar to ivory is of the same nature, though not of the same consistence, as the flour of corn, the spicy substance of the nutmeg, and the meat of the coco-nut, which in other palm trees becomes very hard; that of the date palm becomes quite as hard, if not harder, but it is not white enough or large enough to be worth using by the turner. The doum palm, or forking palm of Thebes, the fruit of which is called ginger-bread nuts at Alexandria, has a similar albumen, which is turned into beads for rosaries. A model of the double coco-nut, or coco de mer, has been made, beautifully carved from its own nut, as hard as ivory, and susceptible of a fine polish. A figure has also been made, forming the shaft of a lady's parasol, which is not to be distinguished from ivory.



THE CAOUTCHOUC TREE.

THE CAOUTCHOUC TREE.

Ficus elastica.

INDIA-RUBBER TREE.

THE India-rubber tree, from which Caoutchouc is chiefly obtained, is a native of South America and India. It has shining, pointed, oval leaves, small uneatable fruits the size of an olive, and long pink buds. It grows to the size of an English sycamore. It is chiefly found on the declivities of mountains, amongst decomposed rocks and vegetable matter. It produces when wounded a great abundance of milk, which yields about one-third of its weight of Caoutchouc. It grows with great rapidity; a tree is described as being twenty-five feet high, with the trunk a foot in diameter, when only four years old. The juice of this valuable plant is used by the natives of Silket to smear over the insides of baskets, constructed of split



FLOWERS AND FRUIT OF THE CAOUTCHOUC TREE.

rattan, which are thus rendered water-tight. Old trees yield a richer juice than young ones. The

milk is extracted by incisions made across the bark, down to the wood, at a distance of about a foot from each other, all round the trunk, or branch, up to the top of the tree, and the higher the more abundant the fluid is said to lie. After one operation the tree requires a fortnight's rest, when it may again be repeated. When the juice is exposed to the air it separates spontaneously into a firm elastic substance, and a foetid whey-coloured liquid. Fifty ounces of pure milky juice taken from the trees in August yielded exactly fifteen ounces and a half of clean washed Caoutchouc. This substance is of the finest quality, and may be obtained in large quantities. The *Ficus elastica* may be often seen in hot-houses in this country.

The use of Caoutchouc with which we are most familiar is that of removing the marks of lead-pencil from paper, and its most common name is India-rubber. It is not much more than a century since it was introduced into Europe, and the manner of its production was at first unknown. In 1735 some members of the French Academy of Sciences visited South America, when they found it was the thickened juice of a Brazilian

tree, and in the following year an account of its preparation was given to the Academy.

The best time for obtaining the greatest quantity is in the rainy season, when the trees being pierced, a thick juice having neither taste nor smell exudes, which on its first appearance is of a yellowish white colour, and afterwards becomes darker by exposure to the atmosphere, and also solidified. Several coatings of the Caoutchouc being successively applied to the exterior surface of clay models of bottles, they are dried over fires, in the course of which each layer of Caoutchouc becomes blackened by the smoke. The lines usually visible on a bottle of India-rubber are traced with a blunt tool. After being exposed to the drying effects of fire for a sufficient length of time, the clay is crushed, and shaken out of the bottles, which are then ready for exportation. The Indians had long been in the habit of making boots of Caoutchouc, which were perfectly waterproof; and the inhabitants of Quito were accustomed to employ it in the manufacture of cloth. Caoutchouc gives a soft and beautiful light, and before the demand in Europe became so great, the South Americans were in the habit of employing it in flambeaux. One

of these, an inch and a half in diameter, and two feet long, burns during twelve hours. The Caoutchouc obtained from India is prepared in a different manner from that which is followed in South America, being when imported in a solid flat state, and not blackened.

The elasticity of Caoutchouc is its most remarkable property ; pieces of it may be stretched, after being soaked in warm water, to seven or eight times their original length without being torn, or having their contractile power destroyed ; and bottles of it may, by means of a condensing syringe, be expanded to many times their original dimensions. If a bottle be soaked in well-washed sulphuric æther until quite soft, it may be inflated by means of the mouth until it has become so thin as to be transparent, and sufficiently light to ascend when filled with hydrogen gas. If dried in this state it will not again contract, and thin sheets of Caoutchouc may thus be formed. A bottle has thus been expanded until it was six feet in diameter.

In æther Caoutchouc readily dissolves, and on the evaporation of the æther it remains unchanged in any of its properties ; this discovery was made

after various experiments by Macquer and other eminent Frenchmen. The success was important, as it enabled Macquer and others to transform it as occasion might require. Macquer used to make hollow tubes of Caoutchouc by coating a stick or cylinder of wax with his new solution, and when the proper thickness was attained, by plunging the whole into hot water, the wax was melted, and flowed out of the tube. In a similar way Frederick the Great of Prussia had a pair of India-rubber boots made: a cast of his leg was taken in clay, and then coated with the solution, after which the clay was broken and taken out piecemeal, leaving a pair of well-shaped, seamless, waterproof boots. The great expense of using æther prevented this process from being carried to any great extent, and various attempts were made to render the tough Caoutchouc as it was imported capable of being changed in form. But about twenty-four years ago a mode of employing India-rubber was devised, and a patent taken out for it. It was discovered that coal-oil was a perfect solvent for Caoutchouc; and this was immediately turned to a practical purpose. Coal-oil used previously to be thrown away as of no value, and could there-

fore be purchased at a cheap rate. After it is dissolved in coal-oil, the Caoutchouc is spread upon the surface of a piece of cloth, upon which a similar piece is then extended, and the whole passed between a pair of rollers. Thus the fabric consists of two pieces of cloth with a layer of Caoutchouc between them, and uniting them together. The cloth thus prepared is so impervious to moisture and to air, that hydrostatic or floating beds for invalids are formed of it, and even beds and cushions are rendered elastic by inflating them.

The balloon in which Mr. Green, the aëronaut, ascended on the day of the coronation of George the Fourth, in 1821, was made of double silk, cemented together by Caoutchouc dissolved in oil of turpentine by a peculiar process; the balloon, from falling into the sea, was rendered unfit for further use, but the silk was cut up, and used as waterproof cloaks, &c., by different persons for several years. Caoutchouc in its solid form is very valuable for many surgical instruments. There are many delicate operations in surgery, in which great elasticity in the instrument is required at the same time that a capability of resisting fluids is

necessary. Caoutchouc is fitted for this in both ways, for if soaked for a short time in warm water, it may be stretched to seven or eight times its natural length, and it will resist the action of watery, spirituous, saline, acid, and oily fluids. The juice, which is called by the natives *Hhvé*, as it exudes from the tree, is a little heavier than water, but when it has become dry it is a little lighter. Caoutchouc is used in the manufacture of numerous articles for which its elasticity renders it adapted. It is also cut by machinery with great rapidity into very fine thread, to which a still greater degree of tenuity is given by stretching it as it is wound tightly upon bobbins, where it is allowed to remain till its contractile power is lost.

This thread is woven into web, and into a variety of ornaments. The fabric of Caoutchouc web was commenced at Vienna, but much improved and extended in the manufactory at St. Denis, near Paris, in which there are about fifteen hundred of the machines for plaiting the thread around the filaments of the elastic gum, and all the other departments in correspondent proportion. The web in its formation undergoes no less than

ten different processes by hand and machinery. A correspondent to the Saturday Magazine states that "very old drying linseed oil, when spread in a thin layer and left for many months exposed to the sun, assumes a consistency very much resembling Caoutchouc, and may be used for many of the purposes to which the latter is applied."

The *Iatropa elastica*, or Syringe Tree of Cayenne in South America, from which a great supply of Caoutchouc is obtained, is a tall, straight, branchless tree, with leaves at the top resembling the *manioc*; green on the upper and white on the under surface. Each of the seed-pods contains three kernels, which, boiled in water, form a sort of butter or lard, used for culinary purposes in Cayenne. The natives apply the Caoutchouc to a variety of uses. They make it into bottles with very narrow necks, through which a reed is introduced; the bottles are then filled with water, and one is given to each guest at an Indian entertainment; the reed is put into the mouth, the bottle is squeezed by the hand, and water is thereby squirted through the reed. This odd mode of supplying the guests with drink obtained for the tree

from which the Caoutchouc is produced the name of the Syringe Tree.

A juice more or less resembling the Caoutchouc may be procured in a similar manner from various trees growing in warm climates. The bark, more especially the leaves, of the white mulberry abound in a milky-juice which is found to have more or less of the properties of Caoutchouc, according to the climate in which the tree grows. It is thought by many to be owing to this property in the leaves of the mulberry that the cocoons of the silk-worm have so much more tenacity of fibre than those of any other insect that feeds on the leaves of trees.

THE BUTTER TREE.

Bassia.

THE Sheah Tree, from which the inhabitants of Kabba, in Africa, prepare their vegetable butter, very much resembles the American oak ; the fruit of it has somewhat the appearance of the Spanish olive. From the kernel of this the butter is prepared, by boiling it in water. The kernel is covered with a sweet pulp, under a thin green rind ; and the butter produced from it, besides the advantage of its keeping the whole year round without salt, is whiter, firmer, and of as rich a flavour, as the best butter made from cow's milk. The growth and preparation of this commodity seem to be amongst the first objects of African industry, and it constitutes a main article of their inland commerce.

In India, in the neighbourhood of Behar, a tree called by the natives "mahwah" produces a fruit of which the properties are similar to those of the



FLOWERS AND FRUIT OF THE BUTTER TREE.

African Sheah. The seeds are full of oil of the consistence of butter or "ghee," which is obtained by pressure; the natives frequently mix it with that substance, as it is much cheaper. They use it

as ghee with their food and in the composition of some sorts of sweetmeats ; they also burn it in their lamps. It is regarded as a salutary remedy for wounds and for eruptions on the skin. At first it is of the consistence of common oil, but soon coagulates. After being kept some time, it acquires a bitterish taste and rancid smell. This might be avoided if more care were taken in its preparation.

The tree, strange to say, will grow in the most barren ground, even amongst stones and gravel.

At Sierra Leone there is also a tree known by the name of the Butter and Tallow Tree, from the yellow greasy juice its fruit yields when cut.

Of another tree, called "phulwah," the seed is collected about August. On opening the shell of the seed, or nut, which is of a fine chestnut colour, smooth and brittle, the kernels appear, of the size and shape of a blanched almond : these are bruised on the smooth stone to the consistence of cream or of a fine pulpy matter ; this is put into a cloth bag, with a moderate weight laid on, and left to stand till the oil or fat is expressed, which becomes immediately of the consistence of hog's lard, and is of a delicate white colour.

THE COW TREE.

Palo de Vaca.

“ The soil untill’d
 Pour’d forth spontaneous and abundant harvest,
 Pulse and small berries, maize in strong luxuriance,
 And slender rice that grows by many waters;
 The forests cast their fruits, in husk or rind,
 Yielding sweet kernels or delicious pulp,
 Smooth oil, cool *milk*, and unfermented wine,
 In rich and exquisite variety.”

MONTGOMERY’S *Pelican Island.*

WHILE Messieurs Humboldt and Bonpland were pursuing their journey from Porto Cabello to the valleys of Aragua, they were frequently told of a tree the juice of which was a vegetable milk of a highly nourishing character. Trees of this kind had been known to the Spanish colonists as early as the year 1683 ; for we read, in a description of the Western Indies, (as all South America was

then called,) printed at that time, the following passage :—"Among the trees which are natives of that place, some are mentioned by Spanish writers which exude a kind of milky liquor; this soon becomes hard like gum, and emits á sweet odour. Others, also, which discharge a liquor like coagulated milk, are used as food without injury."

During the stay of these gentlemen at a plantation called Barbula, they were assured that the negroes drank copiously of this vegetable milk, and considered it a very wholesome beverage. As all the milky juices from plants with which they were acquainted were both acrid and bitter, this account surprised them not a little; but while at the plantation they were fully convinced that the good qualities of the Palo de Vaca, the Cow Tree, had not been exaggerated. The flower of the tree was not seen, but its leaves are about ten inches in length, of a leathery consistence. The fruit is fleshy, and contains one or two nuts. When incisions are made in the trunk of the Cow Tree, it yields abundance of a glutinous milk, tolerably thick, with a pleasant taste, and of an agreeable balsamic smell. It is drunk in the shell of the calabash tree, and in great quantities, by the

natives, both in the morning and evening. They experienced no disagreeable effects from this luxury of nature; the only unpleasant quality is that of its clamminess. Both the negroes and the free people who work in the plantations drink it, and dip their maize or cassava bread in it. The superintendent of the farm declared that the negroes got sensibly fatter during the term that the trees gave out their milk most abundantly.

When this butter is exposed to the air, yellowish thread-like strings, like cheese, settle on the top: these filaments are elastic like India-rubber, but after a space of five or six days become sour and putrid. This substance, from its resemblance to that material, is called cheese. When the juice was shut up in a stopped vial, it deposited very little of this thick part, and retained its balsamic smell.

This extraordinary tree appears to be peculiar to the Cordilleras of the coast, particularly from Barbadoes to the lake of Maracaybo. At Cauca-gua, the natives call the tree which furnishes this nourishing juice the "Milk Tree," and say that they can, from the thickness and colour of the foliage, discover the trunks that yield the most

juice ; just as the herdsman distinguishes from external signs a good milch cow.

“ Amid the number of curious phenomena,” says Mr. Humboldt, “ that have presented themselves to me in the course of my travels, I confess there are few which have so powerfully affected my imagination as the aspect of the Cow Tree. It is not here the solemn shades of forests, the majestic course of rivers, the mountains wrapped in eternal snows, that excite our emotion : a few drops of vegetable juice recal to our minds all the powerfulness and fruitfulness of nature.

“ On the barren side of a rock grows a tree with tough dry leaves : its large woody roots can scarcely penetrate into the stone. During many months of the year not a single shower moistens its foliage ; its branches appear dead and withered ; but yet, when the trunk is pierced, there flows from it a sweet and nourishing milk. It is at sunrise that this vegetable is most abundant. The blacks and natives are then seen hastening from all quarters, furnished with large bowls of calabash to receive the milk, which grows yellow and thickens on the surface. Some drink their bowls under the tree, others carry home the juice to their children ; all

rejoice in a provision so admirably suited to their wants, and which entails upon them neither labour nor care."

The following account of the Milk Tree of Demerara is condensed from an interesting letter received by Professor Jameson from James Smith, Esq. :—

"In a late excursion up the river Demerara, it was my good fortune to fall in, certainly not with the same kind of tree, but with one possessing the mild milky qualities ascribed by Humboldt to the Palo de Vaca. I chanced to stop at the little Indian settlement of Byawadanny, and there I was told of a tree called by the Indians *Hyà-Hyà*, the milk of which was both drinkable and nutritious. I was then in company with Mr. Couchman, the superintendent of a wood-cutting establishment in the immediate vicinity. We had sent a lad to search around for the tree, and he returned in a short time to tell us he had met with it. We followed him to the spot, and found that he had felled the tree. It had fallen across a little rivulet, the water of which, when we arrived, was completely whitened from its juice. On sticking a knife into the bark, a copious stream of milk-like

fluid immediately followed. Our guide drank of it, and Mr. Couchman and myself tasted it after him. It was thicker and richer than cow's milk, and destitute of all acrimony, leaving only a slight feeling of clamminess on the lips. I had already seen it mix freely with the water of the little stream, and as I slept that night near the spot, the next morning Mr. Couchman and myself drank it in warm coffee. With this it mingled equally well, and lost all the viscosity before perceptible in its pure state ; so much so, as to appear to us incapable of being distinguished from animal milk. Mr. Couchman was determined, he said, to use it as a substitute for milk at his little neighbouring woodland establishment. A variety of experiments have since tended to confirm me in my opinion, that it in no way differs in quality from the vegetable milk of the Cow Tree ; yet it is plain that it is not the tree described by Humboldt.

“I am not aware that the *Hyà-Hyà* has, either under its Indian or any other appellation, been ever made known. The Indians inform me it is by no means uncommon in the woods of this colony ; I may therefore hope to procure the fruit. The tree was fortunately coming into flower when

I discovered it; two specimens of which, together with the wood and bark, and a small bottle of the milk, I forward along with this, and beg to have them submitted to your own, as well as the examination of your scientific friends. The milk has now been in bottle thirty-six days: it did not commence to curdle before the seventh day after it was taken from the tree, and even then the process seemed exceedingly slow; so much so, that on the twelfth day I used some of another portion, bottled at the same time, in tea, without its being distinguished from animal milk by those who drank it." The specimens sent to England were examined by Mr. Arnott, who, after careful investigation, pronounced the tree to belong to the genus *Apocynæa*. He remarks, "The usual properties of the milk of the *Apocynæa* are deleterious, and it is rather remarkable to find an instance to the contrary in this tribe; and I do not think there is any other on record. Among the *Asclepiadæ* of Brown, which have similar baneful properties, an instance is also known of the milk being wholesome; I allude to a plant found in Ceylon, which the natives call 'kiriaghuna,' from *kiri* (milk), and who employ its milky juice when the milk

of animals cannot be procured ; its leaves are even boiled by them as a substitute in such dishes as require to be dressed with milk : it is the *Gymnema lactifera* of Brown. The young shoots of several species of plants belonging to both these tribes are used as food."

RAFFLESIA ARNOLDI.

“ The plant, up-springing from the seed,
 Expands into a perfect flower,
 The virgin daughter of the mead,
 Woo’d by the sun, the wind, the shower ;
 In loveliness beyond compare,
 It toils not, spins not, knows no care ;
 Train’d by the secret hand that brings
 All beauty out of waste, and rude,
 It blooms its season, dies, and flings
 Its germs abroad in solitude.

Germ, flower, and fish, the bird, the brute,
 Of every kind occult or known,
 (Each exquisitely form’d to suit
 Its humble lot, and that alone,)
 Through ocean, earth, and air fulfil
 Unconsciously their Maker’s will,
 Who gave, without their toil and thought,
 Strength, beauty, instinct, courage, speed,
 While thro’ the world His pleasure wrought
 Whate’er His wisdom had decreed.”

MONTGOMERY.—*Thoughts and Feelings.*

OF all the surprising productions of the vegetable world, there is not one that can compete with the plant discovered by Dr. Arnold, when accompanying Sir S. Raffles, in 1818, on one of his journeys in the interior of the island of Sumatra. It is the

most gigantic, the most magnificent, and the most extraordinary flower, that has ever been described. The account, both of its discovery and its peculiarities, is best given in the words of Dr. Arnold himself, the first European who ever saw it.

“ At Pulo Lebbar, or the Manna river, two days’ journey inland of Manna, I rejoice to tell you that I happened to meet with what I consider the greatest prodigy of the vegetable world. I had ventured some way from the party, when one of the Malay servants came running to me, with wonder in his eyes, and said, ‘Come with me, sir! come! A flower, very large, beautiful, wonderful!’ I immediately went with the man about a hundred yards in the jungle, and he pointed to a flower growing close to the ground, under the bushes, which was truly astonishing. My first impulse was to cut it up, and carry it to the hut. I therefore seized the Malay’s parang (a kind of woodcutter’s chopping-hook), and finding that it sprang from a small root which ran horizontally (about as large as two fingers or a little more), I soon detached it and removed it to our hut. To tell you the truth, had I been alone, and had there been no witnesses, I should, I think,

have been fearful to mention the dimensions of this flower, so much does it exceed every flower I have ever seen or heard of ; but I had Sir Stamford and Lady Raffles with me, and a Mr. Palsgrave, a respectable man resident at Manna, who, though equally astonished with myself, yet are able to testify as to the truth.

“The whole flower was of a very thick substance. When I first saw it a swarm of flies were hovering over the nectary, and apparently laying their eggs in the substance of it.* It had precisely the smell of tainted beef. Now for the dimensions, which are the most astonishing part of the flower : it measured a full yard across ; Sir Stamford, Lady Raffles, and myself taking immediate measures to be accurate in this respect, by pinning four large sheets of paper together, and cutting them to the size of the flower. The nectarium, or bottom of the flower, in the opinion of us all, would hold twelve pints, and the weight of this prodigy we calculated to be fifteen pounds. There were no leaves or branches to this plant, so that it is probable that the stems bearing leaves

* The leaves of the flower, five in number, were of a dull brick-red, of great thickness, and covered with yellowish-white raised spots.

issue forth at a different period of the year. A guide from the interior said that such flowers were rare, but that he had seen several, and that the natives call them Krûbût."



A second species has been found by Dr. Horsfield in Java; this, though in every respect generally the same, has a most extraordinary difference in the size of the flower, the *Rafflesia Arnoldi* being, as we have said, three feet in diameter, the *Rafflesia Horsfieldi* is only three inches. We must not omit to remark that these extraordinary productions are parasitical, or growing on other plants, and deriving their support from them.

A third species has been detected by Dr. Blume in Nousa Kambangan, a small island dependent on Java, situated in the mouth of the river. He had at first some buds only brought to him, which he, from their structure, judged to be a species of *Rafflesia*; but until he went and gathered specimens himself in the island, where alone it is said to grow, he had no idea of the real nature of the plant. It was in November, 1824, that he visited the spot, where, he says, in the account published in the *Batavian Courant* for March 1825, "it was upon the declivities of some limestone hills, densely covered with entangled and creeping shrubs, that the 'patma,' as it is called by the natives, was to be found. One of the guides stopped from time to time, and having looked attentively at the shrubs, he suddenly pointed to a branch on which grew one plant. It was instantly cut down, and proved to be a species of *Cissus*, known to the natives by the name of 'walerian,' the blossoms of which, however, I could not procure. All the guides now strove to earn the reward I held out for a certain number of these vegetables, and a few minutes had scarcely elapsed, when a little bud was found growing out of the root of the

Cissus, lying upon the ground, and which had the appearance of rather an excrescence of the root itself, than any natural production. Two buds more were soon brought to me in different stages of growth; and indeed it was an astonishing sight which I shall never forget, when I beheld a large flower-bud resembling a cabbage head, and very near its expansion. On another root of the vine I perceived, to my joy, a fully expanded flower of this wonderful plant, having a diameter of two feet, while the middle attracted the eye by its vivid carmine colour."

Dr. Blume has published an account of this gigantic plant in his rare and costly work, the "*Flora Javæ*." The accounts that first reached England of the *Rafflesia* were communicated in a letter to the late Sir Joseph Banks, in which the greatest expectations were formed, that the indefatigable discoverer, Dr. Arnold, from possessing the favour and influence of the governor of the island, would continue his researches with great success. But these hopes and expectations were never to be realized, for the intelligence of the death of Dr. Arnold arrived at the same time as the account of the *Rafflesia*. He fell a victim to

his exertions on his first tour into the interior, and died of a fever about a fortnight after the discovery of the *Rafflesia Arnoldi*.

By way of contrast to this gigantic natural flower, may be mentioned the dwarf plants of the Japanese. By a peculiar process they contrive to retain all the characteristics of the forest tree in a specimen of almost incredible smallness. They cultivate this art with great success, and with many of them it is a ruling passion. The plants thus dwarfed have the habit of the weeping willow. One, which is the most commonly selected for this process, is a kind of yellow plum, *Prunus Mume*. A nurseryman offered for sale, in the year 1826, a plant in flower, which was scarcely three inches high. This *chef d'œuvre* of gardening was shown in a little lacquered box of three tiers, similar to those filled with drugs which the Japanese carry in their belts. In the upper tier was this plum, in the second row a little spruce fir, and in the lowest a bamboo, scarcely an inch and a half in height. This process of dwarfing is one of the most general and lucrative employments in the country.



SOME ACCOUNT OF THE SUBSTANCE COMMONLY KNOWN
UNDER THE NAME OF
RICE PAPER.

Æschynomene paludosa.

THIS substance, so well known to most persons, was for a long time; from its European name perhaps, considered to be an artificial substance, and made of rice. But, if held up to the light, a beautiful cellular tissue is discoverable, such as no art of man can imitate. It is the stem, or rather it may perhaps be called the pith, of a plant which

grows abundantly in the marshy plains of Bengal, or on the borders of extensive lakes in every province between Calcutta and Hurdwar. It is of straggling low growth, and seldom exceeds a diameter of two inches and a half in the stem. It is brought to the Calcutta bazaars in great quantities in a green state, and the thickest stems are cut into thin leaves, from which the natives form artificial flowers and various fancy ornaments to decorate their shrines at Hindoo festivals. The Indians make hats of Rice Paper, by cementing together as many leaves as will produce the requisite thickness; in this way any kind of shape may be formed, and, when covered with silk or cloth, the hats are inconceivably light.

In cutting this material into leaves, the section is not made transversely across the stem, but vertically round the stem. The most perfect stems are of course selected for this purpose, but few are sufficiently free from knots to produce a cutting of more than from nine to ten inches in length. The whole then unrolls like a scroll of common paper.

The article became first well known in England by means of Miss Jane Jack, 1814, who was

celebrated for the beauty of her artificial flowers. Dr. Livingstone brought a quantity of this substance from China, and gave it to that lady. Using the material in the manufacture of her flowers, they attained additional celebrity, fetched very high prices, and were eagerly sought after by persons of the highest rank and most acknowledged taste. For a bouquet which Miss Jack presented to her royal highness the late Princess Charlotte of Wales, she received the sum of 70*l*. The pieces of Rice Paper procured by Dr. Livingstone from the Chinese were dyed of various shades and colours, and did not exceed in size four inches square. The pieces are now much larger, and the price very considerably reduced.

It is an article of great use to the fishermen of the East ; it forms floats of the best description to their extensive nets. The slender stems of the plant are tied into bundles of about three feet long, and with one of these under his arm does every fisherman go out to his daily occupation. With his net on his shoulder, he proceeds to work without a boat, and stretches it in the deepest and most extensive lakes, supported by this buoyant faggot.

By the aid of a somewhat similar plant, the natives of South America pass their largest rivers ; on their arrival at the opposite bank, the light bundle is thrown across their shoulders, and the traveller proceeds onward till a second stream presents itself, when he again commits himself to its waters, relying with full confidence on his frail bark.



CURIOUS VEGETATION OF MADAGASCAR.

AMONG other interesting results of the Rev. Mr. Ellis's recent visits to the island of Madagascar, are the discoveries made by him of curious plants and trees. Some of these are not less remarkable than any described in the previous portions of this little volume—and for that reason we shall accord them a place in this catalogue of vegetable curiosities.

The first we shall notice is the *Angræcum sesquipedale*, which Mr. Ellis thus describes :—"It is very distinct in its habit of growth, having its broad, bluish-green leaves of thin fine texture inserted very closely together in the stalk, and slightly and gracefully curved towards the tip, and its large, waxy, creamy-yellow flowers, four or five on a stalk, bending in a line nearly as horizontal as the leaves. . . . But the great peculiarity of this

flower is its long fleshy spur or tail, one of which depending from a flower I measured, and found to be fourteen inches in length, thus nearly approaching the foot and a half to which it owes its name.

“I often saw the *Angraecum sesquipedale* afterwards, but never met with it in the higher and cooler regions of the country, only in the lower and hottest districts. . . . It does not grow in the moist and thickly-wooded parts of the lower districts of the island, but generally on the straggling trees along the edges of the forest, or in parts where the trees are only thinly spread over the country. It seemed to grow most frequently on the driest parts of the trunks and branches of thinly-leaved trees, and was but seldom seen near the ground. The largest plants were found about twelve or twenty feet from the ground, and smaller ones higher up. It appeared to grow most frequently where there was plenty of light and air. The leaves were neither numerous nor large; and in its native state the plant presented a starved appearance and straggling habit. In this state the flowers were abundant, and deeper in colour than when growing in the shade. The roots are not matted and succulent, like those of the *A. superbum*, but few in

number, separate, long, and wiry, frequently running down the outside of the tree on which they grow, twelve or eighteen feet, or more; and so tough in themselves, and adhering so tenaciously to the bark of the tree, that a considerable amount of force was required to break or detach them.

“I once found the trunk of a tree lying quite rotten on the ground, and the *Angræcum sesquipedale* growing at intervals along its entire length. The roots which had penetrated the decayed vegetable fibre of the tree were comparatively white, stout, and fleshy; the leaves larger, of a darker green, and more succulent; but there were no flowers.”

When this singular plant, which is the largest flowered of all the orchids, was brought to England, it thrived well, and flowered early in the year, and shortly afterwards the following account of it was published by Dr. Lindley:—

“The only original account that we have hitherto had of this extraordinary plant, consists of a figure, and a few words of description, published in 1822, by Du Petit Thouars, in his ‘History of the Plants found in Madagascar, the Isle of France, and Bourbon.’ His statement is, that it grows in

Madagascar only, where it flowers in the month of August; that its stem is eighteen inches high, with close, ribbon-shaped, two-lobed leaves, a foot long, by one and a half inches broad; and that its flowers are very large and white. . . . He called it *sesquipedalian*, because its flowers were a foot and a half long.

“From the time that the existence of this noble plant was known, it has been the anxious wish of Europeans to procure it for cultivation; and at last, at the end of thirty-five years, the object has been gained. The Rev. Mr. Ellis, in his visit to Madagascar, met with it in the forests of that island, and having succeeded in sending home three plants in a living state, one of them flowered magnificently at Hoddesden.

“The plant forms a stem about eighteen inches high, covered with long leathery leaves in two ranks, like *Vanda tricolor*, and its allies; but they have a much more beautiful appearance, owing to a drooping habit, and a delicate bloom which clothes their surface. From the axils of the uppermost of these leaves appear short stiff flower-stalks, each bearing three and sometimes five flowers, extending seven inches in breadth, and the same in

height. They are furnished with a firm, curved, tapering, tail-like spur, about fourteen inches long. When first open the flower is slightly tinged with green; except the tip, which is always pure white; after a short time the green disappears, and the whole surface acquires the softest waxy texture, and perfect whiteness. In this condition they remain, preserving all their delicate beauty for more than five weeks. Even before they expand, the greenish buds, which are three inches long, have a noble appearance."

The discovery of a plant still more curious than the above, is thus narrated by Mr. Ellis. "But the most rare and choice botanical acquisition which I made during this visit, was the beautiful aquatic plant, *Ouvirandra fenestralis*, which Sir W. J. Hooker designates 'one of the most curious of nature's vegetable productions,' which he has since described as the *water yam* or *lace leaf*. Dr. Lindley had drawn my attention to this and other Madagascar plants before my departure, and had shown me a drawing of it in the work of Du Petit Thouars. At Mauritius, M. Bojer, a distinguished naturalist, who had formerly resided in Madagascar, very frankly and kindly informed me of the locali-

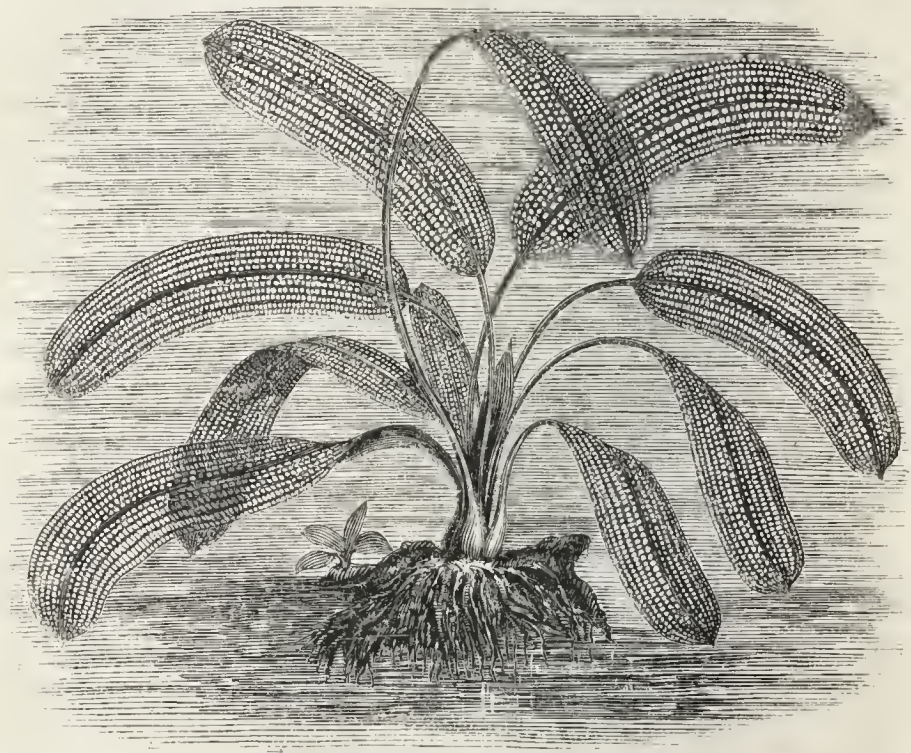
ties in which the plants I was anxious to obtain were most likely to be found. From the work of Du Petit Thouars, in M. Bojer's possession, I copied the *Ouvirandra* in a size rather larger than the engraving, and by exhibiting this to the natives, at length found one man who knew where it grew. His master, who had shown me many acts of kindness, allowed him to go and search for it, and after two or three days he told me he had found it growing in a stream, but that there were so many crocodiles in the water that he could not get it. . . . At length he brought me a fine lot of plants in excellent condition, and I was glad to reward him for his trouble, and to take them immediately under my own charge.

“The natives describe this plant as growing in running streams. The root is about the size of a man's thumb in thickness, and six or nine inches long, often branching in different directions like the roots of the ginger or turmeric, but in one continuous growth, not a succession of distinct formations attached at the termination of one and the commencement of another. The root is composed of a white fleshy substance, apparently without large or tough fibres, and is covered with a some-

what thick light brown skin. I was informed that it also grew in places which were dry at certain seasons of the year; that the leaves then died down, but the root, buried in the mud, retained its vitality, and, when the water returned, fresh leaves burst forth. The natives spoke of it as tenacious of life, and said that wherever the earth around even the smallest portion of it remained moist, that portion would put forth leaves when again covered with water. The plant is valuable to the natives, who, at certain seasons of the year, gather it as an article of food—the fleshy root, when cooked, yielding a farinaceous substance, resembling the yam. Hence its native name, *ouvirandrano*, literally, yam of the water.

“The *ouvirandra* is not only a rare and curious, but a singularly beautiful plant, both in structure and colour. From the several crowns of the branching root, growing often a foot or more deep in the water, a number of graceful leaves, nine or ten inches long, and two or three inches wide, spread out horizontally just beneath the surface of the water. The flower-stalks rise from the centre of the leaves, and the branching or forked flower is curious; but the structure of the leaf is peculiarly

so, and seems like a living fibrous skeleton rather than the entire leaf. The longitudinal fibres extend in curved lines along its entire length, and are united by threadlike fibres or veins, crossing them



LACE LEAF PLANT.

at right angles from side to side, at a short distance from each other. The whole leaf looks as if composed of fine tendrils, wrought after a most regular

pattern, so as to resemble a piece of bright green lace or open needlework. Each leaf rises from the crown, on the root, like a short delicate-looking pale green or yellow fibre, gradually unfolding its feathery-looking sides, and increasing its size as it spreads beneath the water. The leaves, in their several stages of growth, pass through almost every gradation of colour, from a pale yellow to a dark olive green, becoming brown, or even black, before they finally decay ; air-bubbles of considerable size frequently appearing under the full-formed and healthy leaves. It is scarcely possible to imagine any object of the kind more attractive and beautiful than a full-grown specimen of this plant, with its dark green leaves, forming the limit of a circle two or three feet in diameter, and in the transparent water within that circle presenting leaves in every stage of development, both as to colour and size. Nor is it the least curious to notice that these slender and fragile structures, apparently not more substantial than the gossamer, and flexible as a feather, still possess a tenacity and wiriness, which allow the delicate leaf to be raised by the hand to the surface of the water without injury."

This interesting plant was also safely brought to

England by Mr. Ellis, who presented specimens of it to the Royal Gardens at Kew, to the Horticultural Society at Chiswick, to the gardens at Regent's Park, and to the Crystal Palace—at all of which places it has thriven remarkably well.

During his last visit to Madagascar, while traversing the interior of the island, on his route to Antananarivo, the capital, Mr. Ellis fell in with the "Traveller's Tree," which in the central high lands is abundant, on the sides of the hills and in the valleys, and wherever there is any continuous moisture.

"This tree, *Urania speciosa*, is altogether the most remarkable that has been discovered in Madagascar; and the extent to which it prevails may be inferred from the native name, *ravinala*, by which it was designated by Sonnerat, its discoverer. *Ravinala* is, literally, leaf of the forest, as if it was the leaf by which the forest was characterised, which is the fact where it abounds, though in many parts it is not met with at all. The tree rises from the ground with a thick succulent stem, like that of the plantain, or the larger species of *strelitzia*, to both of which it bears a strong resemblance. It sends out from the centre of the stem long broad leaves, like those of the

plantain, only less fragile, and rising, not round the stalk, but in two lines on opposite sides, so that as the leaves increase, and the lower ones droop at the end, or extend horizontally, the tree presents the appearance of a large open fan. When the stem rises ten or twelve feet high, the lower part of the outer covering becomes hard and dry, like the bark of the cocoa-nut tree. Many of the trees in this region were at least thirty feet from the ground, to the lowest leaves. I frequently counted from twenty to twenty-four leaves on a single tree, the stalk of each leaf being six or eight feet long, and the broad leaf itself four or six feet more.

“The whole of these twenty-four bright green gigantic leaves, spread out like a fan at the top of a trunk thirty feet high, presented a spectacle as impressive as it was to me rare and beautiful ; and in this part of the country they were the most conspicuous objects for miles together, and were it not that these vast bright green shining leaves are slit on each side by the winds, and so flutter in smaller portions with the passing breeze, the prevalence of this tree would impart a degree of almost inconceivable magnificence to the vegetation of the country.

“In the fan-like head of the traveller’s tree, there were generally three or four branches of seed pods. The parts of fructification seemed to be enclosed in a tough firm spathe, like those of the cocoa-nut; but the subsequent development was more like that of the fruit of the plantain. When the pods, or seed vessels, of which there were forty or fifty on each bunch, were ripe, they burst open, and each pod was seen to enclose thirty or more seeds, in shape like a small bean, but enveloped in a fine silky fibre of the most brilliant blue or purple colour.

“But this tree has been most celebrated for containing, even during the most arid season, a large quantity of pure fresh water, supplying to the *traveller* the place of wells in the desert. Whenever I inquired of the natives, they always affirmed that such was the fact, and that so abundant and pure was the water, that when men were at work near the trees, they did not take the trouble to go to the stream for water, but drew off and drank the water from the tree. Having formerly been somewhat sceptical on this point, I determined to examine some of the trees; and during my journey this morning we stopped near a clump of them.



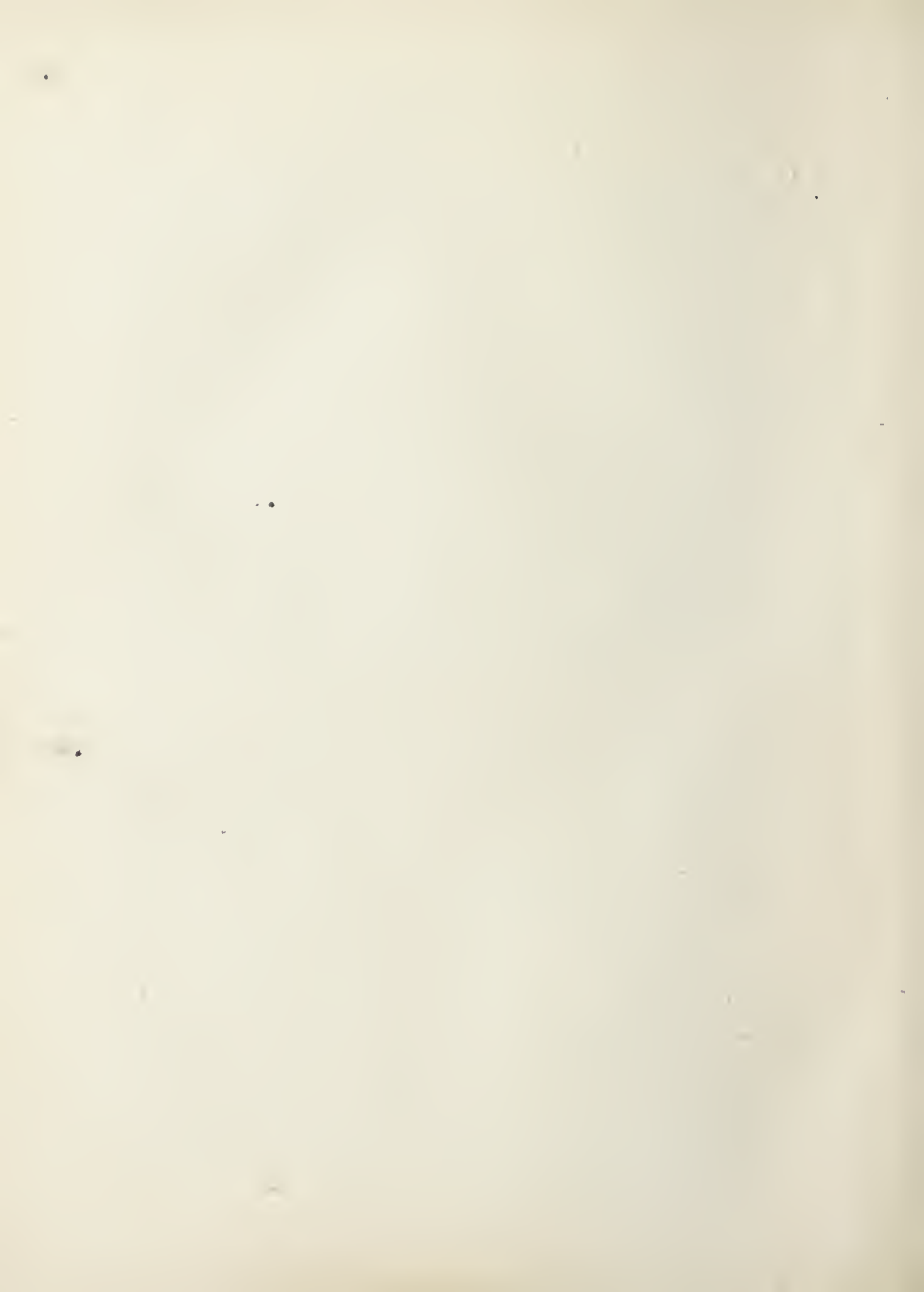
TRAVELLER'S TREE.

One of my bearers struck a spear four or five inches deep into the thick firm end of the stalk of the leaf, about six inches above its junction with the trunk, and on drawing it back, a stream of pure clear water gushed out, about a quart of which we caught in a pitcher, and all drank of it on the spot. It was cool, clear, and perfectly sweet. On further examination, I found that there was no filtration of the water through any part of the plant, as I had been led to suppose when I had seen water drawn by Sir William Hooker from one of the specimens in the palm house at Kew. There was a kind of natural cavity, or cistern, at the base of the stalk of each of the leaves, above its union with the stem, and the water which had been collected in the broad and ribbed surface of the leaf had flowed down a groove or spout on the upper side of the stalk into this natural reservoir, whence it supplied nutriment to the tree, and refreshment to the traveller or labourer.

“But in Madagascar this tree might with propriety be called the *builder's tree*, rather than the traveller's tree. Its leaves form the thatch of all the houses on the eastern side of the island. The stems of its leaves form the partitions, and often

sides, of the houses ; and the hard outside bark is stripped from the inner and soft part, and having been beaten out flat, is laid for flooring ; and I have seen the entire floor of a long well-built house covered with its bark, each piece being at least eighteen inches wide, and twenty or thirty feet long. The leaf, when green, is used as a wrapper for packages, and keeps out the rain. Large quantities are also sold every morning in the markets, as it serves the purpose of table-cloth, dishes, and plates at meals ; and folded into certain forms, is used instead of spoons, and drinking vessels."

THE END.





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